Mining CONGRESS JOURNAL

Quality-built
by the high-speed diesel pioneer

Economical
proved on jobs such as yours

and Serviced
by Cummins specialists located near you

CUMMINS Dependable DIESELS
SINCE 1918...PIONEER OF PROFITABLE POWER THROUGH HIGH SPEED DIESELS

CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA

Mining Congress Journal

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309 MUNSEY BLDG., WASHINGTON 4, D. C.

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•

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American 23	American 12	American 2
American 24	American 12A	American 3
American 25	American 14	American 3A
American 26	American 14A	American 4
Genite A	Burton A	American 5
		American 112

• • •

GELATINOUS

Permigel 1
Permigel 2A
Permigel 3

THROUGH intensive research, chemical control, inspection and unremitting care in manufacture this list of permissibles has been designed to provide an explosive fitted to any seam of coal and for both hand and mechanical loading. There is a complete range of velocities and densities and in the list will be found one particularly adapted to your blasting problem.

AMERICAN explosives and AMERICAN electric blasting caps have proved their merits through years of service in representative coal mines. Through well located plants and distributing points prompt delivery service is assured.

• *Capable field engineers are available at your call.*

AMERICAN CYANAMID COMPANY

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SALES OFFICES: PITTSBURGH, Pa. Bluefield, West Va. Scranton, Pa. Chicago, Ill.
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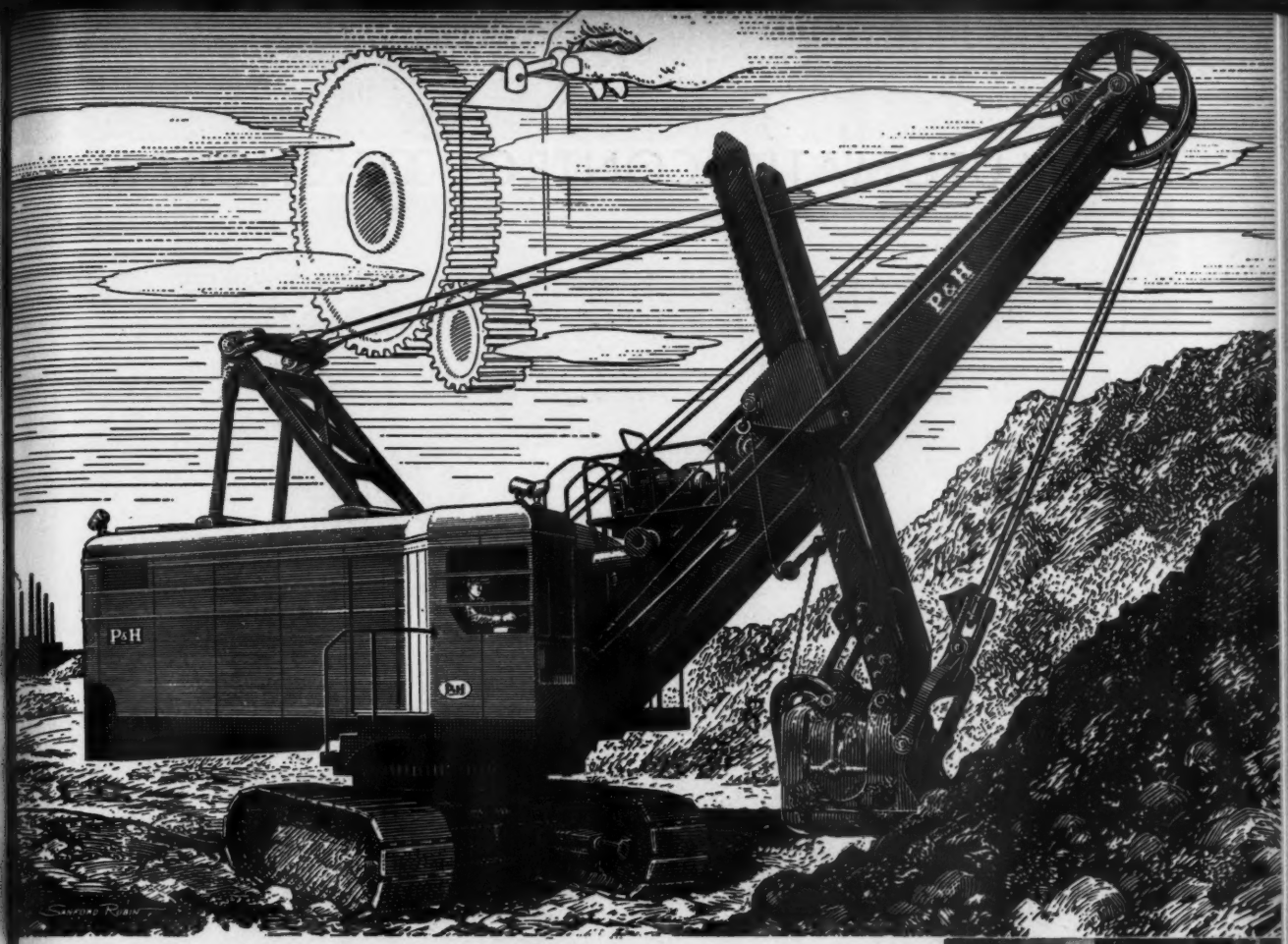

Simpler, Easier Move-up

Now, the mere flick of a switch is all it takes!

It's as quick and easy as that to move into a new digging position with a P&H Electric Shovel. There are no mechanical complications of transferring from one shovel motion to another.

P&H Electric Shovels are provided with their own independent propel machinery, powered by a heavy-duty shovel type motor which is not connected with hoist or swing motions. Controlled by the master propel switch, conveniently located beside the operator, it makes change from dig to propel in an instant — saving time on every move up.

This simpler, easier operation is another important advantage which contributes to lower tonnage costs in all kinds of open pit digging. It is another example of P&H added values that give you more time for actual production.

"FREE ENTERPRISE" MEANS:

better products
for more people
at lower cost.

P&H ELECTRIC SHOVELS

HARNISCHFEGER

4555 W. National Ave., Milwaukee 14, Wi

LEADING THE WAY IN ELECTRIC SHOVEL DEVELOPMENT

AUTOMATIC CONTROL OF SHORTWALL

Collected slack is readily loaded out by a Duckbill-Shaker Conveyor

CUTTINGS WITH GOODMAN BUGDUSTER . . .

(PATENTED)

Hand Shoveling is Eliminated
Kerf is Kept Clean
There is No Dust

Bugduster can be installed on any Goodman Type 512 Shortwall

GOODMAN MANUFACTURING COMPANY
CHICAGO 9, ILLINOIS

MINING INDUSTRY

Served by

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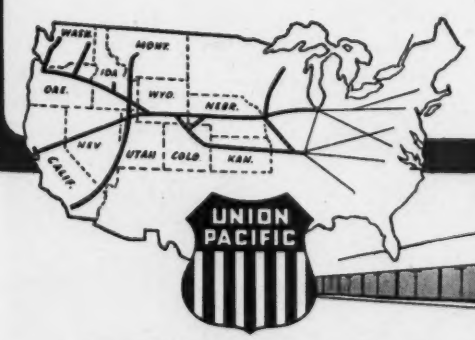
Your industry is one of hundreds served by Union Pacific. Every shipper is assured of efficient, dependable transportation when materials or merchandise are earmarked for the Strategic Middle Route, uniting the East with the Midwest, Intermountain, and Pacific Coast States.

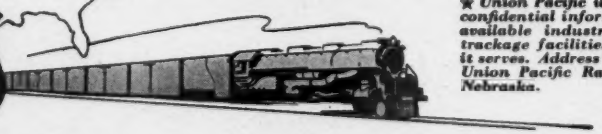
Union Pacific provides specifically designed cars, various services and departments, to assure proper handling of a wide diversity of products.

Union Pacific's facilities and equipment are ready to meet the heaviest needs of commerce. Traffic experts are stationed from coast-to-coast. They will help you with that *next* shipment—and every shipment.

For dependable, fast freight service always . . .

be Specific –
say "Union Pacific"





★ ***Union Pacific will gladly furnish confidential information regarding available industrial sites having trackage facilities in the territory it serves. Address Industrial Dept., Union Pacific Railroad, Omaha 2, Nebraska.***

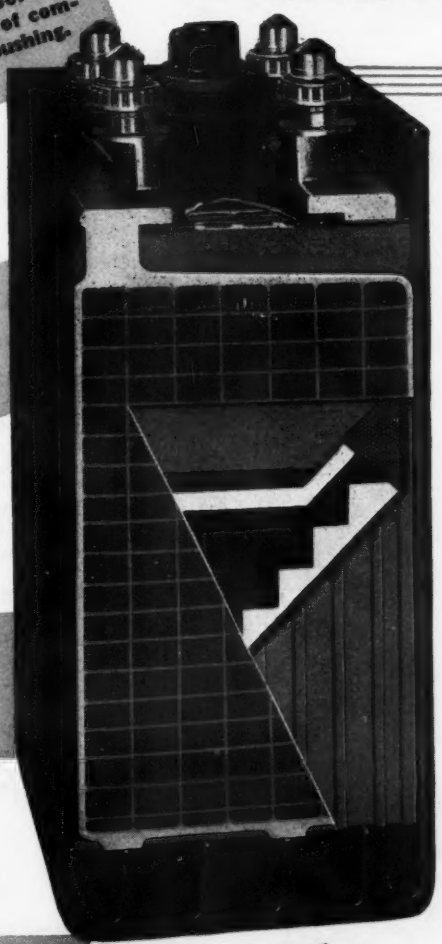
UNION PACIFIC RAILROAD

The Strategic Middle Route

IN WIND, RAIN, SNOW OR HAIL • YOUR FREIGHT GETS THERE BY RAIL!

Setting New Records

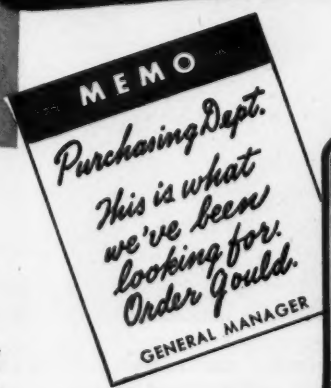
Gould Kathanode Batteries have a service life 80% longer than flat plate batteries


Leak-proof seal instead of common bushing.
Duraper rubber separators replace wood type.
Double-wedge grids replace box type.
Black Oxide, a new type of active material compounded by Gould.
Unit-Seal perforated rubber envelope for extra plate protection.
Spun glass mats replace ordinary glass wool.
Monobloc containers of high impact strength.
Special negative active material compounded by Gould.

Gould introduced the Kathanode battery in 1925. Then, for the first time, American industry had a battery that would deliver 100% or more of rated capacity throughout its entire service life.

Since 1925 every part of the Gould Kathanode has been the subject of constant research and field tests. Many of the improvements developed are listed at the left. Together they mean that the Kathanode of today not only has greater capacity but maintains that capacity 80% longer than ordinary batteries.

Longer service life means more work done per dollar invested. Get the facts. Write Dept. 1311, Gould Storage Battery Corporation, Depew, N. Y., for the latest Kathanode catalog.



GOULD KATHANODE BATTERIES

GOULD STORAGE BATTERY CORPORATION, Depew, N. Y.

Service Centers: Atlanta • Boston • Buffalo • Chicago • Cincinnati Cleveland • Detroit • Kansas City • Los Angeles • New York • Philadelphia Pittsburgh • St. Louis • St. Paul • San Francisco • Seattle

Award Winner ★1944★ MOVES

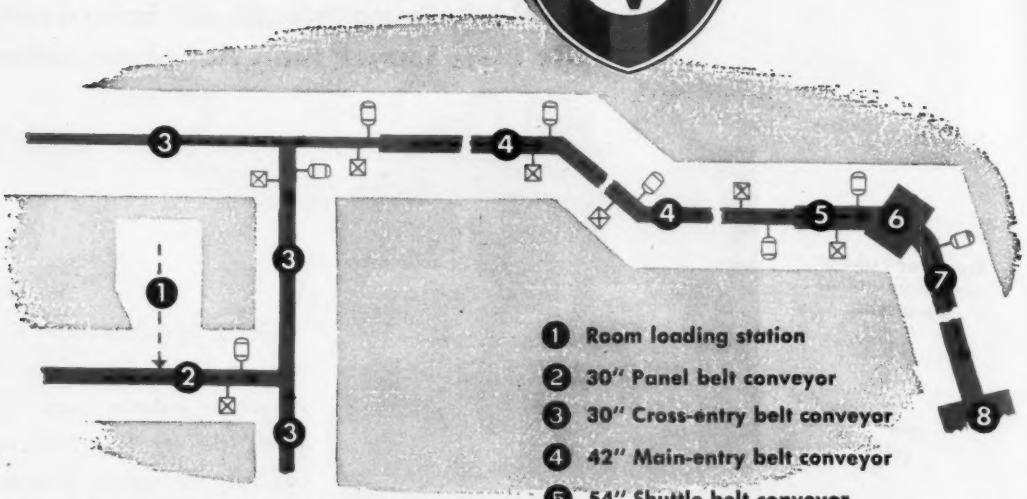
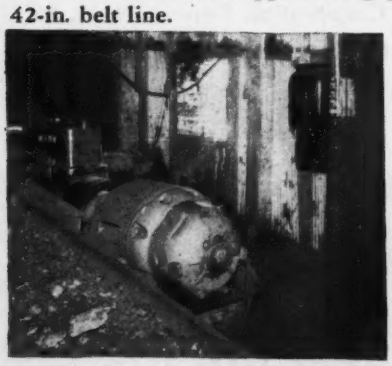
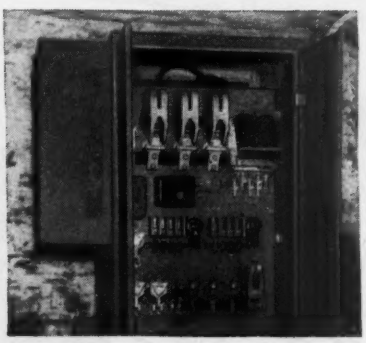

1 Room loading station
2 30" Panel belt conveyor
3 30" Cross-entry belt conveyor
4 42" Main-entry belt conveyor
5 54" Shuttle belt conveyor
6 120-Ton surge bin
7 48" Slope belt conveyor
8 Wet cleaning plant
Conveyor-drive motor
Rotary conveyor-drive switch

Diagram shows how a G-E-equipped network of 32-in. and 42-in. belt conveyors serve North Diamond No. 2 over a mile stretch from face to slope belt.

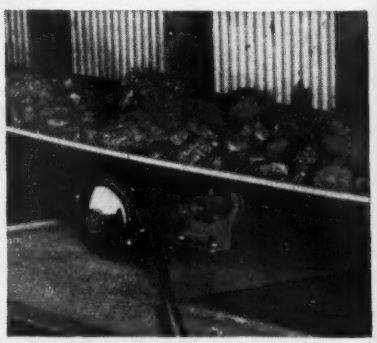
Coal on a 30-in. belt, approaching point of transfer to 42-in. belt line.



G-E wound-rotor motors like the one above drive the main conveyor belts. Typical ratings at 40 hp and higher.



G-E combination starters with full undervoltage and overload protection, control all conveyor motors rated 50-hp and higher.



This G-E rotary switch cannot be actuated until a predetermined belt speed is reached. It assures coordinated conveyor speeds.

5,000 TONS A DAY

... on G-E-protected belt system

Mile-long conveyors at North Diamond No. 2 depend on G-E interlocking drives and controls for high-speed operation without risking coal pile-ups or personnel hazards.

At the North Diamond No. 2 mine in Earlington, Ky. you won't find idle face loaders waiting for conveyor bottlenecks to clear. That's because this efficiency award-winning mine moves coal *fast* — over 5000 tons of it every 24 hours! This calls for high conveyor speeds without confusion, pile-ups, or accidents. All this is made possible by a highly reliable system of G-E conveyor drives and interlocking controls.

From cross-entry belts straight through to slope belt, conveyor operation is tightly co-ordinated. Neither power interruptions, shutdowns for inspection, nor operators' errors can tangle up this system. Here's what G-E interlocking control does:

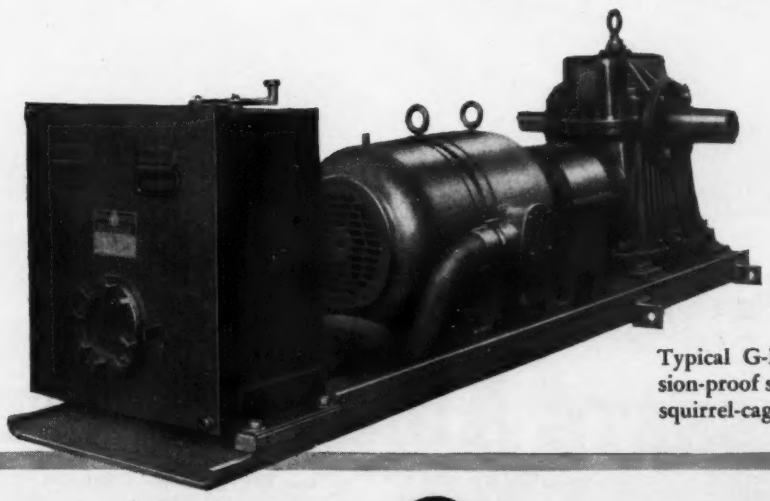
1. It makes every belt start in its proper sequence.
2. It prevents an intermediate belt from starting until the belt preceding it is up to speed.
3. When it stops a belt, it automatically stops all belts feeding it.
4. It reduces spillage possibilities at transfer stations by cutting down belt coasting.

Some of the control developments that made possible these advantages are G-E starters that permit easy motor starting without sacrificing torque, important when belts are fully loaded; G-E relays that respond to control signals over 2500-foot leaps; and a G-E rotary-type switch which precisely times the operation of belt-drive starters.

Greater Safety

Besides the increased output you can expect from G-E interlocking conveyor control, you make more efficient use of power when conveyor motors are prevented from starting all at once. Safety conditions are improved because unexpected restarts are eliminated. Maintenance is less when motors start and operate at the right speeds.

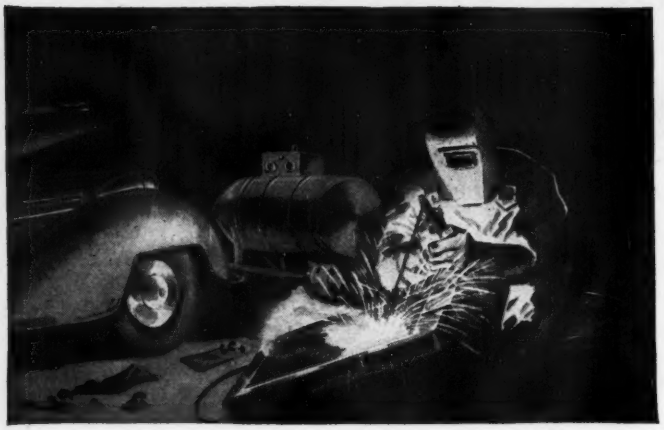
We will be glad to discuss ways and means of applying this new system of conveyor control in your mines. Just call the nearest G-E office. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*



Typical G-E a-c full-voltage explosion-proof starter, connected to a G-E squirrel-cage induction motor.

GENERAL ELECTRIC

657 54-148



HOW TO GET ARC WELDERS IN A HURRY!

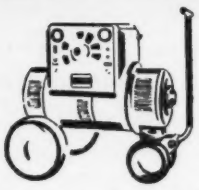
IT'S EASY FOR THE SMALL BUSINESSMAN TO GET THEM AT A SAVING.

Hundreds of arc welders are available to small businesses for immediate delivery. Some are unused. Some are used. All were made by well known manufacturers.

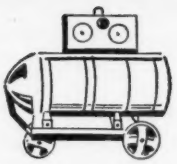
Now they are offered for sale at real bargain prices.

These are the type welders needed by garages, repair shops and maintenance shops. The large inventory includes welders of 200, 300 and 400 Ampere Rating, either DC or AC. They are located at various points throughout the country and may be inspected before purchase.

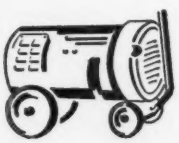
To obtain complete information on availability, location and condition of the equipment you want, fill out the coupon and send it to your nearest War Assets Administration Regional Office.



Hobart—Standard models of this make available in large quantities and most ratings.



Lincoln—In all models and most ratings. Many in the popular 300—400 Ampere size.



Westinghouse—Portable models available in limited quantities.

Electrodes and Welding Rods—Millions of pounds available in all types and sizes.

For full information clip and mail this coupon to:

War Assets Administration:
Please send me complete information on the availability, condition and location of the following types of equipment.

....Hobart Arc Welders ....Westinghouse Arc Welders
....Lincoln Arc Welders ....Electrodes and Welding Rods
Arc Welding Equipment AC.... DC....
Electric Motor Driven: Volts....Phase....Cycles....
Transformer Type: Volts....Phase....Cycles....

Name .....
Firm .....
Address .....State.....
City .....

All Arc Welders are subject to priority regulations. VETERANS OF WORLD WAR II are invited to be certified at the War Assets Administration Certifying Office serving their area and then to purchase the material offered herein.

EXPORTERS

The War Assets Administration solicits your inquiries. Communicate with your foreign clients promptly.

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GOVERNMENT OWNED SURPLUS

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649-3

OUR MINE A PROVING GROUND
The mine staff of the Climax Molybdenum Company has conducted a research program on wear resistant steels involving the milling of millions of tons of ore. A resident alloy steel metallurgist, with the assistance of our Detroit Research Laboratory, has made available at the mine the broad experience of the Climax technical organization regarding the composition, heat treatment and structure of the steels tested.
These tests have already established the value of molybdenum steels for many applications. Our research program continues for still further improvement.
The results of these tests have proved valuable to other mine operators. You can obtain information which may lower your operating costs, by addressing a request to our Denver, Colorado office in the Continental Oil Building.
MOLYBDIC OXIDE—BRIQUETTED OR CANNED • FERROMOLYBDENUM • "CALCIUM MOLYBDATE"
CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.
Climax Molybdenum Company
500 Fifth Avenue · New York City
MOLY

PROGRESS *Report*

on the Widened Application of HEAVY-MEDIA SEPARATION

IN a year during which the coal industry has been beset by critical economic and production problems, Heavy-Media Separation Processes offered by Cyanamid made substantial gains. Noteworthy are:

NEW PLANTS: **Heavy-Media Separation plants are being incorporated in two large preparation plants for important coal producers. A unit of 250 tons an hour is treating middlings refuse in a preparation plant of another prominent company. Other plants under active consideration by well known operators should be underway shortly.**

TEST RESULTS: **Companies representing an important part of America's bituminous production have sent carload lots to the Heavy-Media Separation Pilot Plant in the Cyanamid Mineral Dressing Laboratory. Repeated tests have conclusively demonstrated that Heavy-Media Separation can closely and economically duplicate the washability curves of these coals. Many preparation engineers have witnessed Heavy-Media Separation tests. Our Laboratory Guest Register is fast becoming a "Who's Who" of the industry.**

PROCESS DEVELOPMENT: **Interesting outgrowth of testing work and plant design has been the refinement of equipment and improvement of techniques to widen the applicability of Heavy-Media Separation to include**

Treatment of Finer Sizes: **In the treatment of full size-range coal by an improved technique, greater cleaning efficiency in the very fine sizes has been noted.**

Treatment of Larger Sizes: **Larger sizes can now be handled expeditiously in a more compact vessel than previously contemplated. Details of these refinements will soon be made available.**

Heavy-Media Separation has inherent advantages over previous preparation methods particularly in treating coal with a high-percentage of near-gravity material with a high and variable percentage of refuse...where gravity must be maintained more accurately through a wider range (both higher or lower) than attained by older processes.

Heavy-Media Separation operates at equal efficiency on any fragmentary materials. It makes a sharp, uniform separation at any desired specific gravity from 1.25 to 3.40 . . . which can be maintained continuously with ± 0.01, or quickly changed as characteristics of feed coal vary.

Heavy-Media Separation plants can be designed for multiple-product separation from run-of-mine-feed in full size-range. Continuous reclamation by magnetic separation minimizes medium loss. Plants can be started or shut down without loss of medium, plant efficiency or bank-loss of coal.

Cyanamid continues to welcome the opportunity to work with you or contracting engineers of your choice.

AMERICAN CYANAMID COMPANY
30 Rockefeller Plaza, New York 20, N. Y.

AMERICAN CYANAMID COMPANY PRODUCTS

9 Years of Dependable Performance

and

LOW MAINTENANCE

One of the many popular sizes of CP Hand-Held Coal Drills suitable for a wide range of operations; ordinarily used by one or two men, depending upon the pressure required to feed the auger into the coal.

In 1927 a prominent coal mine purchased eight CP Electric Coal Drills. So satisfactory was their performance that each year additional CP Electric Coal Drills were installed, until today a large number are in operation.

In 1945 this company mined more than six million tons of coal, for nearly all of which CP Drills were used for drilling the shot holes.

Whatever your drilling conditions, you can obtain a CP Electric Drill exactly suited to your requirements, since Chicago Pneumatic makes the world's largest line of Electric Coal Drills, hand-held and post-mounted. They are notable for their flexibility and low maintenance cost. Write for complete information.

CP Post-Mounted Coal Drills are described in Catalog 901; CP Hand-Held Drills in Catalog 902; CP "Whippet" Drills in S.P. 1995.

★★★★★★★★★
PNEUMATIC TOOLS
ELECTRIC TOOLS
HYDRAULIC TOOLS
ROCK DRILLS

CHICAGO PNEUMATIC
TOOL COMPANY
General Offices: 8 East 44th Street, New York 17, N. Y.

★★★★★★★★★
AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES

Solving a difficult coal handling problem

WITH TIMKEN BEARINGS

The Belfry Coal Company in the Williamson, W. Va. field, was faced with a transportation problem — how to move coal over difficult terrain from their new mine in Kentucky across the Tug River to the Norfolk & Western Railroad in West Virginia.

The Industrial Division of Continental Gin Company, Birmingham, Alabama, solved their problem by designing a 680′ belt conveyor system with Continental Timken Bearing Equipped idlers carried on a suspension bridge as shown in the photographs.

Today Timken Tapered Roller Bearings help move 150 tons of coal each hour at a speed of 200 feet per minute. Timken Bearings were used in the conveyor system because the idlers had to be free-rolling while carrying radial, thrust and combined loads under all speeds and operating conditions. Timken Bearings gave assurance to the Belfry Coal Company that moving parts would be kept in correct and constant alignment; lubrication would be simplified and greatly reduced, thus giving years of smooth, dependable performance at low maintenance cost.

Make sure you are getting these advantages by specifying Timken Bearings for your new equipment. Look for the trade-mark "TIMKEN" on every bearing you buy. The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN Tapered Roller BEARING EQUIPPED

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

48 YEARS OF ENGINEERING AND METALLURGICAL DEVELOPMENT

MINIMIZE "BUG DUST"

with KENNAMETAL UNDERCUTTER BITS

One of the big "added values" in Kennametal Undercutter Bits is that cuttings are clean, heavy, and coarse—therefore producing less hazardous "bug dust." Here's why—

Hard, durable Kennametal tips (much harder than hardest tool steel) cut coal from the kerf in small chips, instead of abrading and grinding it into powder. When "bug dust" is minimized, working conditions improve—and better working conditions benefit miner and mine operator alike.

This is just one more reason why long-lasting Kennametal Undercutter Bits are replacing formerly-used types in scores of mines. For other reasons, read "results" at the right.

Kennametal Undercutter Bits are available for all commonly-used chains. For prices and particulars on them, as well as on drill bits, augers, plug and core bits—send for Catalog M-2.

KENNAMETAL

SUPERIOR CEMENTED CARBIDES

KENNAMETAL Inc., LATROBE, PA.

RESULTS

- "35 places cut between resharpenings through coal having clay veins—that's average performance of your bits. In nearby areas, where face is clean, bits are cutting up to 250 places between resharpenings."

  Pennsylvania Mine

- "Cut 312 places, average 35 feet, in 5-block seam, and bits were still good for many more regrinds."

  West Virginia Mine

- "Using steel bits, it took 2 hours to cut across 22' place in sulphur-streaked coal—3 bit changes being required on each place. Your bits did same job in 15 minutes per place, with no bit changes."

  Kentucky Mine

- "Have cut 577 12 foot places with one set of your bits—13,986 tons of coal. Have resharpened the bits five times, and they are still good for plenty of cutting."

  Ohio Mine

EXIDE-IRONCLADS

FOR EXTRA POWER . . .
FOR GREATER SAFETY

Maximum power . . . and maximum safety . . . are assured in mines where locomotives, trammers and shuttlecars are powered by Exide-Ironclads. These rugged, dependable batteries are designed and built to meet all conditions encountered in mine haulage operations . . . to deliver peak performance in steady, heavy service . . . and to reduce haulage costs per ton, per man.

Exide-Ironclads have the *high power ability* required for frequent "stop and go" service . . . a *high maintained voltage* throughout discharge . . . and a *high capacity* that assures sustained speeds throughout the day with full shift availability. You can always count on Exide-Ironclads for dependability, safety, long-life, economy and ease of maintenance.

If you have a special battery problem, or wish more detailed information, write for booklet Form 1982.

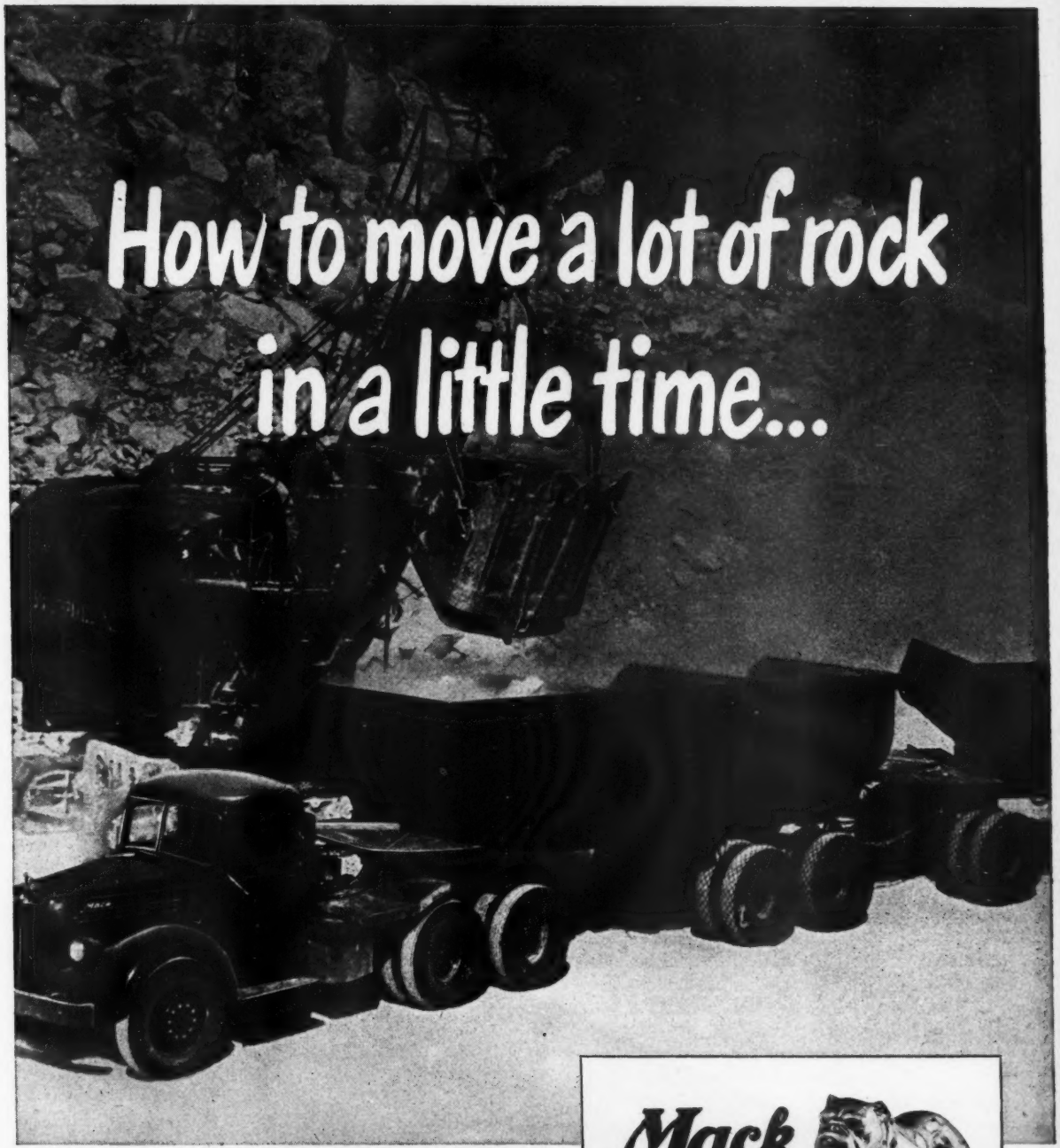
SAFE POWER

★ **MINE OPERATORS:** If you have not read the U. S. Bureau of Mines circular I. C. 7328, be sure to get a copy from the Bureau of Mines, Washington, D. C.

●

THE ELECTRIC STORAGE BATTERY COMPANY
Philadelphia 32
Exide Batteries of Canada, Limited, Toronto

Scott Aviation Corporation
Announces
Bureau of Mines Approval
No. 1308
for
Scott Air-Pak



• • • **Southwestern Portland Cement Co., Victorsville, California** does it by using two Mack six-wheelers. As Southwestern puts it, "Since 1941, these trucks have run in excess of 400,000 miles over rough quarry roads, giving excellent satisfaction. Bogies have proved most successful, needing practically no repair at last inspection." The company has backed up these words with an order for three more LMSW-M Models.

That's the way the Mack balanced bogie and the exclusive Mack Power Divider handle any job. No bogie hopping, unequal tire wear, or hard steering. Torque reaction is balanced out, eliminating weight transfer and assuring equal traction on all wheels.

Figure mileage and performance such as this in terms of your job. The same reliable, efficient service will mean extra profits through lower operating costs. Plan a Mack in your operation.

Mack
TRUCKS
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Editorials

JULIAN W. FEISS, *Editor*

November, 1946

AGAIN MR. LEWIS

ONCE more John L. Lewis is cracking his whip in Washington. At a time when coal miners are receiving a wage ($62.37 a week average as reported by the Bureau of Labor Statistics) which is the highest paid to any class of industrial workers, Mr. Lewis is demanding more concessions from the Government under threat of a winter strike. Rightfully Secretary Krug has refused to reopen the Krug-Lewis agreement under which the mines are operating, and has told Mr. Lewis to negotiate a contract with the operators, rather than with the Government, "which is only the interim custodian of these properties."

Since last May when the mines were taken over to avert economic disaster, the Government has made diligent efforts to return them to private hands as quickly as this could be accomplished with an assurance of continued production. Lewis, however, seems determined to get more while the getting seems good regardless of the ultimate consequences.

In our September editorial we discussed the inroads of competitive fuels and the dangers of Government control of the coal industry. On top of concessions won in the Krug-Lewis agreement which are inherently repugnant to our conception of private enterprise and democratic government, Mr. Lewis is now making further demands which threaten to set off a disastrous spiral of inflation. John L. Lewis has today reached the pinnacle of his career. We are now about to find out which is the most powerful—John L. Lewis or the Government of the United States.

THE PEOPLE HAVE SPOKEN

ALTHOUGH it is still too early to appraise the ultimate results of our November elections, the defeat at the polls of the party in power vindicates conclusively the American system at a time when many foreign governments are swinging more and more towards centralized control. The American people have become dissatisfied with bureaucracy, disgusted with left-wing New Dealers, and finally, the electorate has expressed its opposition to those rapacious labor leaders who today are undermining our economic system.

In Arizona, Nebraska and South Dakota the right to work was upheld over the closed shop. In Massachusetts the voters approved a constitutional amendment requiring labor unions to submit financial statements in the same manner as corporations.

There is a place for union labor in our industrial system and the desirability of unions is not questioned by the electorate. However, when labor leadership attempts to usurp the powers of government the people rebel. The November elections have indicated that the American public has at last become sufficiently aroused to protect the right of life, liberty, and the pursuit of happiness granted under the Constitution.

RELIEF AND MORALE

NOTHING can be more demoralizing to man than unrestricted charity. The existence of relief rolls at a time when there is an acute labor shortage in our Western mining states is a serious indictment of this human frailty. The easy availability of relief, plus the high wage scale for underground work, has resulted in a curious situation. Many miners put in a portion of their time underground and once sufficient pay has been accumulated they apply for relief and then exist at the expense of the taxpayer.

Government policies have encouraged a similar attitude on the part of the returning veteran who has often been encouraged to join the "52/20 Club" rather than look for a job. General Omar Bradley, who has a true sense of national responsibility as well as sympathy for the veteran, has opposed such policies as demoralizing to the veteran and jeopardous to the nation's fiscal position.

While not denying the desirability of relief when circumstances warrant, it appears to us that each case must be decided on its own merits. Relief should only be resorted to under extreme emergency and never considered as routine procedure. The dole after World War I has left its stamp on British labor and today British industry is reaping the whirlwind. There is no place for a pauper class in the United States. Unless steps are taken to curb the unrestricted use of our relief and unemployment compensation rolls, the time will come when charity will take the place of initiative. Were this to happen in the United States, our industrial and economic life would receive a blow from which it could never recover.

The Role of Safety Equipment in Reducing Coal Mine Accidents

Covered explosive cars and insulated couplings are important safety features

The Development of Permissible Equipment Has Involved Many Years of Painstaking Effort and the Scope of This Work Embraces Every Type of Underground Device

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D. HARRINGTON
Chief, Health & Safety Branch
AND
R. G. WARNCKE
Mining Engineerer, Bureau of Mines
U. S. Department of Interior

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RELATIVELY recently, a responsible representative of a widely circulated popular magazine asked why the coal-mining industry utilizes no safety equipment or devices; the man is known as being well-informed, but it was difficult to convince him that many scores of different kinds of safety devices and equipment aggregating hundreds of thousands of individual units reaching in value into the tens of millions of dollars (probably as much as $250,000,000 and certainly more than $100,000,000) are in use in our coal mines. Many of them have been in use for several decades. It is absolutely certain that, if a great variety and a vast number of safety devices and equipment (augmented by constant application of safety methods and procedures) were not in use, the coal mines of the United States could not be kept working enough to supply the great quantities of coal needed for the development and maintenance of the dominant position of the United States today in manufacturing, commerce, military position, and general greatness.

Numerous types of safety devices and equipment were in use in our coal mines before 1910, but creation of the United States Bureau of Mines that year gave a definite impetus to the invention and use of numerous kinds of safety devices and equipment, especially the latter. Early in the Bureau's career its engineers realized the growing menace of open-flame lights and electric arcs and sparks as initiating agents in gas and dust explosions causing heavy loss of life. The Bureau enlisted the cooperation of some of the progressive, conscientious mine operators, as well as manufacturers of electrical equipment and electrical devices, and inaugurated the Bureau of Mines permissibility system. Under this the Bureau tests

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An electrician with insulated gloves adjusts a disconnect switch while standing on a grounding mat

(according to carefully devised schedules or procedures) scores of types of electrical mining equipment designed and constructed with a view to preventing ignitions of gas or dust by electric arcs or sparks or flames when such apparatus is used in coal mines.

All Types of Approved Equipment

Electrical equipment approved by the Bureau as safe for use in gassy or dusty coal mines includes coal drills and drilling machines; cutting machines; loading machines, conveyors and shortwall loaders, belt-type conveyors, shovel-type loaders, chain-type conveyors, shaker conveyors, power shovels, pit-car loaders, entry loaders, face conveyors, dragline conveyors, elevating conveyors, portable conveyors, room conveyors, mobile conveyors, sectional conveyors, gathering conveyors, and other types. Also approved is the electrical equipment for mine fans; and mining and cutting machines, shortwall mining machines, arc-wall mining machines, slabbing machines, shear-drilling machines, longwall mining machines, cutting-shearing machines, low-vein cutting machines, shearing machines, mining machines with drill, power-truck-operated mining machines, arc-face machines, universal cutting machines, slate-cutting machines, top-cutting machines, pillar-cutting machines, mining-machine trucks, hitch cutters, and other types. Almost all of these machines have one or more variations, such as A.C. and D.C. motors, one or two motors, etc.

There are also permissible electrically operated air compressors, pumps of numerous types and capacities, rock-dusting machines, shuttle cars, caterpillar trucks, mining-machine trucks, machinery-moving units, and underground hoists (including room hoists, tuggers, car spotters, etc.). Several types of junction boxes and some mine telephones, and several types of blasting machines have also been approved by the Bureau.

Numerous types and sizes of electrically operated underground locomotives have been approved for underground use, all powered by storage batteries. No approvals have ever been issued for any kind of trolley-type locomotive, and no approvals have ever been given for internal-combustion engines in locomotives for underground use; a schedule for testing Diesel locomotives for underground use in coal mines was issued in September, 1944, but as of October, 1946, no Diesel locomotives have been submitted to the Bureau for test.

The Bureau has approved several types of power trucks using storage batteries, among them power tanks, power-truck and main-line-haulage locomotives, power-truck and gathering locomotives, tandem locomotives and trailer water tanks.

Development of Electric Lamps

One of the most important contributions to safety in mining, more especially coal mining, is the development of electric cap lamps, and in this the Bureau of Mines played an important role. Several types of electric cap lamps have been tested and approved by the Bureau, and since the first electric cap lamps were made available about 1915, much progress has been made in their adoption by the mining industry, both coal and non-coal. Unfortunately, however, at least one-third of the coal miners of the United States continue to use open lights, notwithstanding the fact that they not only are inefficient as to lighting but an ever-existent menace as to initiation of fires or explosions, by far the most dreaded occurrences in coal mines.

In addition to electric cap lamps, the Bureau has tested and approved electric hand lamps, portable electric floodlights, signal lamps, animal lamps, electric lanterns, inspection lamps, and several types of flashlights.

Flame safety lamps are also tested and approved by the Bureau for the purpose of testing for explosive or extinctive gases, but they are inefficient for lighting and anything but safe unless used by careful, well-informed persons; their misuse in United States coal mines has initiated explosion disasters costing hundreds of lives.

With a realization of the limitations of flame safety lamps the Bureau has issued a schedule for testing methane detectors, and several, all using electricity, have been approved. These methane detectors have some advantages over flame safety lamps, but they give no warning of any kind as to the presence of extinctive gases. There is a definite want or need for a piece of equipment that will furnish a suitable dependable light and also give warning as to extinctive or toxic gases; this appears to be a *"large order,"* but the need is definite and at times urgent in both coal and non-coal mines.

Permissible Explosives

One of the greatest safety improvements in coal mining was the introduction of permissible explosives, largely through the efforts of the Bureau of Mines. Hundreds of explosives have been tested by the Bureau, and at present the permissi-

The scraping of drill cuttings from a blast hole is good safety practice

Shot firer's equipment consists of: detonator box, cable-reel, explosive box, shot firing magneto, wood tamping stick, and roof testing stick

bility list contains 180 brands suitable for safe blasting in coal mines. These various brands consist of permissible explosives that can be used for blasting all types of coal, and also for blasting rock in coal mines. Permissible explosives require certain conditions for maintenance of their permissibility in blasting which have in turn brought out other safety practices and equipment, such as the use of electric detonators, permissible blasting devices for firing shots, incombustible stemming, and wooden tamping sticks, each of which eliminates some hazards of blasting in coal mines.

As with safety electrical equipment, the mining industry has not taken full advantage of this type of explosive, which through the past 35 years has proved reasonably safe for blasting coal. Before permissible explosives were introduced (about 1909), black blasting powder was the main explosive for coal-mine use, but since that date, the black powder is gradually being eliminated; in fact, during 1944 it comprised only about 18 per cent of the total quantity of explosives used by the coal-mining industry. However, it was not until 1941 that the quantity of permissible explosives used in the bituminous mines exceeded that of black blasting powder, while in anthracite mines, permissibles exceeded black blasting powder as early as 1926.

Protective Breathing Apparatus

When the Bureau of Mines came into existence in 1910, mine explosions and mine fires—with heavy loss of life and property—were occurring about three or four times as frequently as at present, and Bureau field men gained much experience in connection with respiratory protective apparatus, especially oxygen breathing apparatus. At that time all available oxygen breathing apparatus was of foreign make; by bitter experience it was found to be far from safe or efficient, and the Bureau of Mines proceeded to study the subject intensively and developed or very closely aided development of the Gibbs, Paul, and McCaa oxygen breathing apparatus. The Bureau started its testing procedure by issuing a testing schedule for oxygen breathing apparatus in March, 1919, followed by similar testing schedules for Gas Masks in May, 1919; Hose Masks in 1927, and Dust Respirators in 1934.

Under the Bureau's testing procedure the Gibbs and the Paul, both two-hour types of self-contained oxygen breathing apparatus, were approved in January, 1920. The Fleuss-Davis Proto oxygen breathing ap-

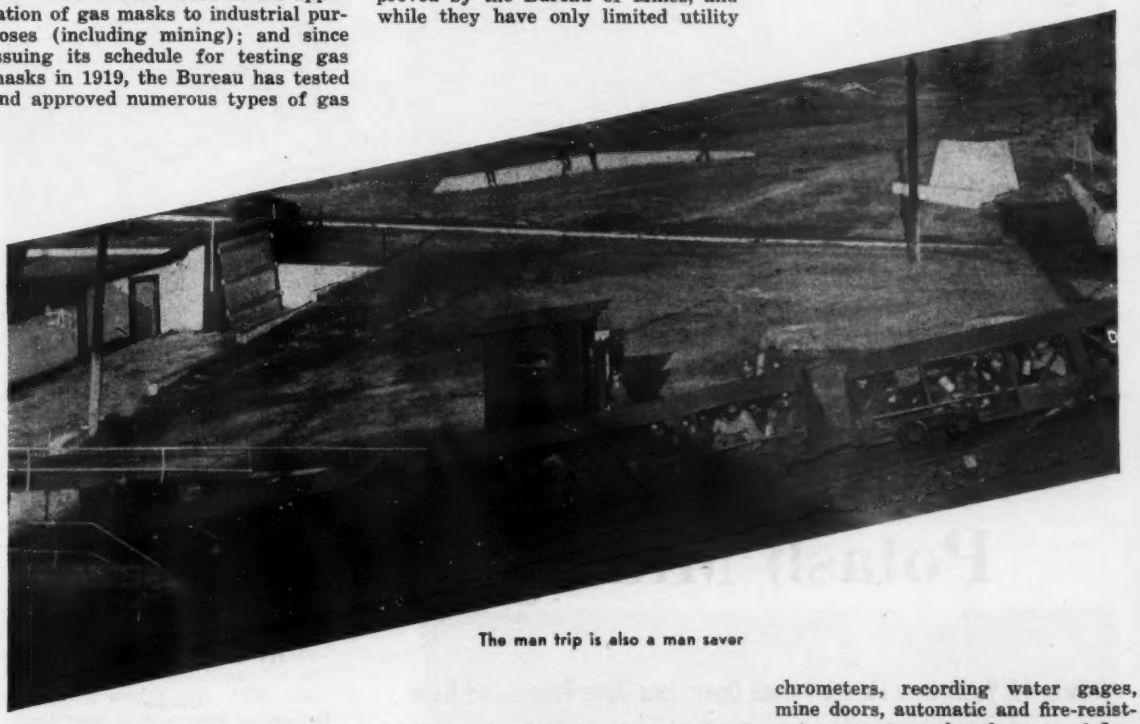
Permissable lamps and protective caps should be standard equipment in all mine operations today

Permissible telephones are equipped with lightning arrestors and grounded metallic casings

paratus (an American modification of British apparatus) was approved in February, 1924; the McCaa (two-hour type) in August, 1925, and the Draeger (German) two-hour apparatus in August, 1929. Recently an entirely new type of oxygen breathing apparatus, the M. S. A. Chemox, which generates its own oxygen, was approved. Also a new type of self-contained breathing apparatus using compressed air instead of oxygen was approved and two companies were given approvals, the Scott Air Pak Co. and the Mine Safety Appliances Company.

After the use of gas masks in World War I the Bureau aided in the application of gas masks to industrial purposes (including mining); and since issuing its schedule for testing gas masks in 1919, the Bureau has tested and approved numerous types of gas masks for protection against the breathing of limited percentages of such toxic gases as carbon monoxide, chlorine gas, hydrocyanic acid gas, organic vapors, and gases and organic vapors, hydrogen sulphide and petroleum vapors, and ammonia gas, and some gas masks have been approved for use in limited quantities or percentages of any gases or combinations of gases. These gas masks have definite limitations, since they are approved for use for limited percentages (usually 2 per cent maximum) of gases or combinations of gases, and there is very little opportunity to determine or to know what percentage of any gas may be in the air in which the gas masks are used. Also, no gas mask gives the slightest protection against a deficiency of oxygen in the atmosphere and many gas-mask wearers have been overcome or killed upon breathing air in which oxygen was deficient, usually when the oxygen content of the air is lower than 10 per cent. Also notwithstanding the protection of certain types of gas masks in breathing air with less than 2 per cent hydrocyanic acid gas, the latter gas may be absorbed through the skin under some conditions, and hence may be hazardous to wearers of any kind of respiratory apparatus, including gas masks or self-contained breathing apparatus.

Various types of hose masks and air-line respirators have been approved by the Bureau of Mines, and while they have only limited utility in the mining industry, they are used to good advantage in petroleum and numerous other types of industrial work. Abrasive blasting helmets, hoods, or masks of several types have been approved by the Bureau of Mines, and this equipment is utilized to a limited extent by the mining industry. Numerous types of dust respirators have been approved by the Bureau, most of them being applicable to use in the mining and allied industries for protection against dust disease when other preventive measures cannot be used.

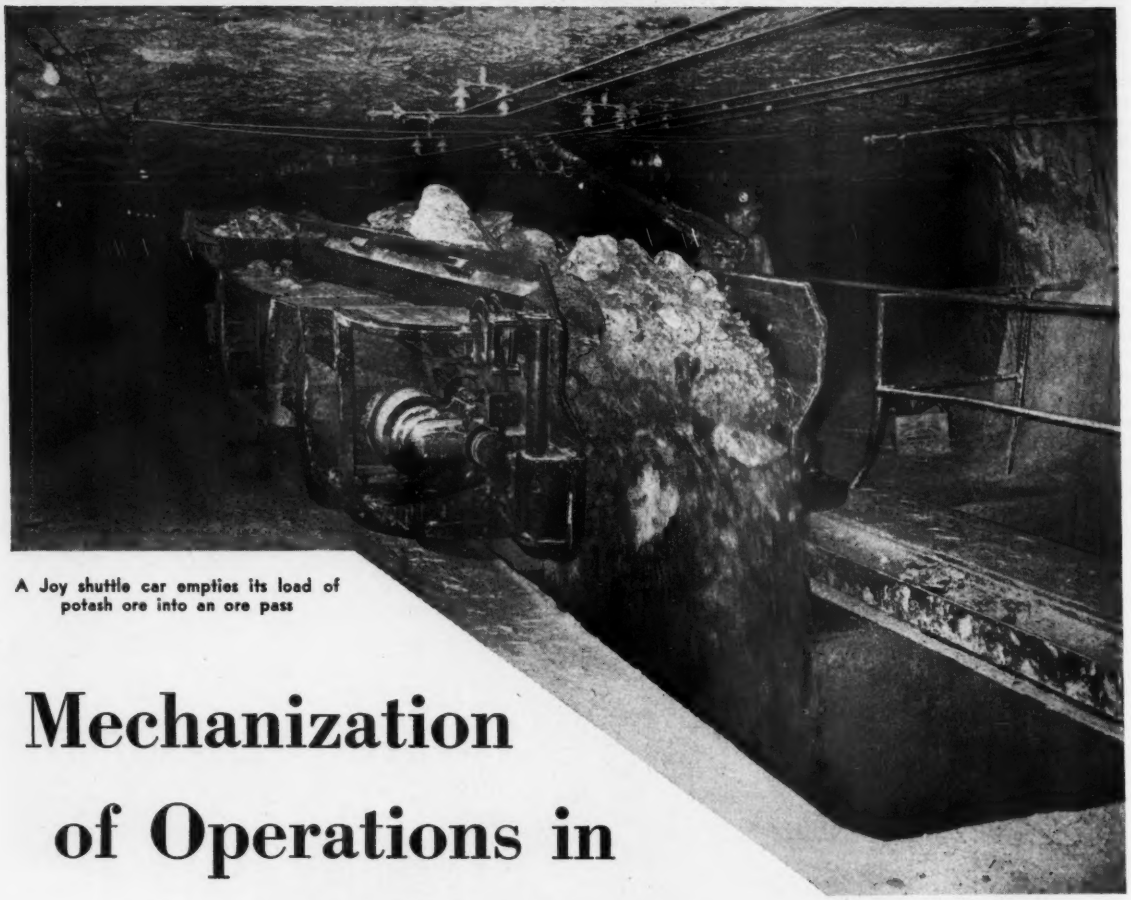


The man trip is also a man saver

Safety Devices Developed by Mining Companies

The safety devices and equipment enumerated or discussed in the foregoing have been fostered largely by the Bureau of Mines through its permissible testing procedure in connection with the prevention of mine fires and explosions (chiefly in coal mining) and in protection against toxic gases or dusts. Scores of other kinds and types of safety equipment and devices are used in coal mining without undergoing tests by Government bodies. Some of them have been in use in coal mines for several decades, such as water sprays on the cutter bars of mining machines; the extended use of water lines and hose in attempting to control dispersion of coal dust into the mine air; the use of anemometers, barometers, psychrometers, recording water gages, mine doors, automatic and fire-resistant overcasts, and undercasts of fireproof material, etc., in connection with ventilation; the use of pit-car brakes, automatic couplings, car blocks, overspeed and overwind devices on hoists, safety catches on mine cages, automatic derailing and automatic rerailing devices, man-trip stops on slopes, safety chains on man-trips on slopes, car retarders on shaft or slope partings, incombustible stemming, the blocking of track frogs and switches, the installation and use of shaft signaling systems, and the use of brick, concrete, and steel in supporting strata on haulage roads. These and many other kinds and types of safety equipment and devices have been used in the coal mines of the United States for decades.

(Note: Part II of this article will appear in our next issue.)



A Joy shuttle car empties its load of potash ore into an ore pass

Mechanization of Operations in Potash Mining

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By G. T. HARLEY

Manager
International Minerals & Chemical Corp.

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Within 15 Years New Mexico Potash Operations Have Progressed from Crude Hand Mining to a Preeminent Place in the Field of Mechanization

THE development of mechanized operations in the potash mines at Carlsbad, N. Mex., is an interesting story. Fifteen years ago when mining first started, strictly hand mining methods were used. In this relatively short period of time through the concerted efforts of the three companies now in the field, the present high degree of mechanization has been reached. The practices developed at Carlsbad have served as models for the development of other bedded deposits in the nonmetallic field, and some of the methods in current use may find partial application in the field of metal mining in bedded deposits that are flat lying or gently inclined.

The main potash deposits of the region, those containing sylvite, lie at a depth of 1,000 ft. below the surface where they are overlain and underlain by salt. From the surface to the top of the salt there is 400 to 500 ft. of beds of Permian red shales and sands, interbedded with anydrite, gypsum, and limestone. Several water horizons occur above the salt which must be sealed off in the shafts. This is done by reinforced concrete linings which extend from surface to about 25 ft. into the top of the salt. The thickness of the sylvite bed being mined varies from four ft. to more than 13 ft. In the southern part of the field, in International ground, land owned and operated by our company, two beds of langbeinite and mixed langbeinite-sylvinite ore have been found at 800 ft. and at 850 ft. depth, respectively. The bed at 800 ft. depth is presently being mined. So far as is known, this is the only occurrence of commercial langbeinite ore in the United States.

Regionally, the beds dip gently to the southeast, but in some areas quite steep dips are encountered. Locally, dips up to 25 per cent have been found, but the normal mining methods have

not been carried on where dips exceed 15 per cent. Ore bodies are roughly defined by core drilling, and as mining advances more holes may be drilled to guide the operation.

The first mining in the district was by United States Potash Company in February, 1931, after preliminary core drilling and shaft sinking had been completed. Production was at the rate of 200 tons per day and the ores were trucked to Carlsbad and shipped as manure salt. Methods used were those common in metal mining practice, with the use of wet jackhammers, hand mucking from a rough bottom and hand tramming. Under the direction of the United States Geological Survey the mine had been laid out with double entries, which were driven eight by eight ft. in dimension, and widened by slabbing. Track gauge was 24 in., which has been maintained to date, but later five-ton Granby type cars were added with a Granby type dump at the shaft.

The Pioneer Period of Mechanization

Experimental work was started in March, 1932, on a three-drum scraper with turntable base, and by February, 1933, this machine had been adopted as standard. The first electric auger drill was operated in November, 1932, and in December, 1932, a Sullivan mining machine with eight-ft. cutter bar was in use. In December, 1932, there was also installed a Goodman hydraulic power shovel, but as it was found not particularly adaptable to driving entries and first mining headings, it was soon set aside. Potash Company of America completed its shaft late in 1933, and first production at the rate of 200 tons per day was made in February, 1934. Hand mining methods were used at this time while awaiting the arrival of mining machinery. This company, managed by men with coal mining background, opened its mine on a coal mining plan using a three-entry system with wide openings. Track was laid with 42-in. gauge, 52-lb. rail in main entries and 30-lb. rail in all other workings. Five-ton solid body cars were installed, height 38½ in. above the rail, and a rotary dump at the shaft. Early haulage was with six-ton Mancha storage battery locomotives. The two-drum Sullivan scraper with turntable was developed, and first mining was a modified longwall in which an entry was first driven and then widened by slabbing.

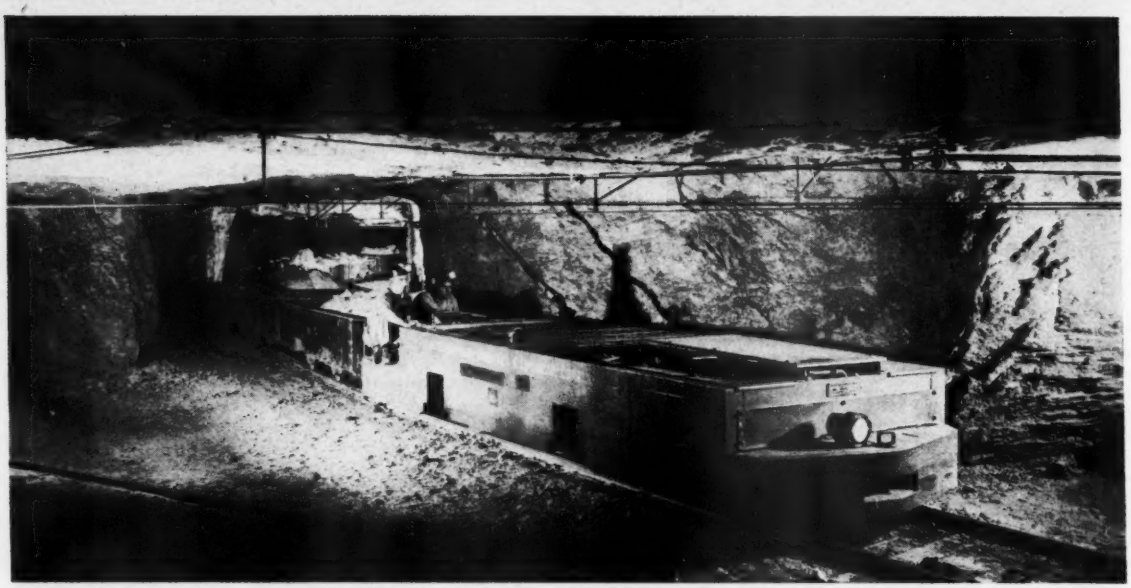
Undercutters and electric auger drills were installed as soon as they could be received within six months after the start of mining. In 1935 this company purchased three Jeffrey 44CC track loaders with which to do development work. Thereafter scrapers were used in rooms and the track loaders in development entries. With continued development of scrapers in the district and the final adoption of the three-drum scraper with turntable, the scraper finally superceded the 44CC for all work. The 44CC was found to be of low capacity and could load effectively from no more than 16 ft. of width.

In 1931 the Jeffrey L400 track loading machine was tried, and in 1941 its sturdier successor, the L600, which could clean out a heading 23 ft. in width, was used to drive development entries and the scrapers were kept for use on production in rooms.

International Minerals and Chemical Corporation started its underground development campaign in May, 1940, after having completed its shaft bottom work with the use of a Goodman type G-20 Shaker Conveyor with Duckbill. Development headings were driven with a Joy 11 BU tractor loader, loading into solid-bottom cars of 5.5 tons capacity. Track was laid with 42-in. gauge, 60-lb. rail in main entries and 40-lb. rail at faces and later in rooms. The second Joy loader in the district was installed on the Langbeinite (800) level, and was serviced by two Joy 42E shuttle cars which operated on a double overhead trolley system and on cable reel when ahead of the trolley. Since the beginning of operations all mining at International has been performed with

Undercutting is essential to much of the operation. Here a Goodman mining machine is completing a cut

A high degree of mechanization characterizes potash mining. Joy loaders and shuttle cars are an integral part of this operation



Here main haulage is done with a 20-ton Westinghouse trolley locomotive

Joy equipment using the 11 BU loader, and shuttle cars of the 42D, 60E and 42E types. At first, part of the loading was into mine cars, but at present all ore is loaded into shuttle cars.

Now the E-types are the trolley cable reel and the D-types are storage battery. Lee-Norse MT-7 mine tractors are used on the 800 level for miscellaneous haulage of supplies and equipment and special trucks have been developed for transferring Joy loaders over great distances and for moving drill equipment.

In 1941, Potash Company of America adopted the Joy equipment for mining in rooms using at first the 11 BU and the 42D shuttle car, but due to a low height of seam in some sections, there has been added the 14 BU loader and the 32D shuttle cars. United States Potash Company converted in part to Joy equipment in September of 1945 and has since completed its installation. At this time International Minerals and Chemical Corporation loads all ore and waste with Joy equipment; United States Potash Company moves probably 95 per cent with Joy loaders, the remaining 5 per cent being moved by scrapers, and Potash Company of America moves probably 90 per cent with Joy equipment and the remaining 10 per cent with Jeffrey track loaders.

In February, 1944, United States Potash Company purchased a Caterpillar bulldozer with which to clean headings along the ribs and for haulageway cleanup, and its application has been very successful.

Recently at Potash Company of America a Sullivan 7 AU track-mounted Universal machine with a nine-ft. cutter bar has been used in development headings.

Mining Methods Used Are Similar to Coal

Potash is mined in the same general manner as coal but with a different technique. In blasting coal it is difficult to keep a maximum lump content and a minimum of fines in the pile. Potash is compressible or resilient and tends to break into large boulders that are difficult to handle. Because of these properties, potash, even though undercut the same as coal, requires closer drilling and higher charges of explosives to secure satisfactory breakage.

Throughout the district the room and pillar system of mining is in use. Pillars vary in size from 32 by 41 ft. at International and United States Potash Company to a maximum of 40 by 60 in other sections. Rooms and break-throughs vary from 24 ft. to 36 ft. in width and two, three or four parallel entries are driven. These vary in width from 16 ft. in waste to 20, 24, 32 or 36 ft. in ore, depending on whether track loading machines or trackless machines are used.

The daily production of crude ore in the district is something over 12,000 tons, of which International is currently producing 4,700 tons.

All mines are completely electrified. Main cables into the mine and along main entries carry 2,300 volts. Portable air-cooled transformers are used on each section, mounted on skids with all accessory equipment attached. It

Underground electric shops are fully equipped for all types of repairs

takes only a little over an hour to disconnect one of these transformers and set it up again in a new section of the mine. Power to all mining equipment is 220 volts, three-phase, 60 cycles, fed through secondary cables from the transformer to junction boxes maintained within 75 to 100 ft. of the working faces. The haulage system operates on 250-volt direct current, and motor generator sets are installed at intervals underground to preserve the efficiency of the system over long distances. In all probability future units added on this line will be mercury arc rectifiers at International.

All faces are undercut to a depth of nine ft. If the seam is of sufficient height to clear the loading equipment, the cut is made in the ore; if only a few additional inches are needed, the cut is made in salt. Where the bed is quite thin, the ore may be mined out, and from one to three ft. of back shot down to provide headroom for further work.

Undercutting is done with Sullivan 7B and Goodman 512 shortwall machines which have a feed of five to six in. per minute and are driven by 50-h.p. AC motors. Jack pipes have been replaced by hooked bolts placed in holes drilled vertically in the floor. Bits are of various kinds; some are of self-tempering steel that are sharpened in the surface shop by a mechanical sharpener. Others are the Goodman Mo-Tung or the Bowdil throw-away bit, and recently the Carboloy insert bit has been developed and is coming into general use in the district. With the Carboloy bit the cutter chain has been reduced from 10 to nine rows of bits, or in the miner's parlance, 10 to nine positions.

Machines are transported by rail-mounted trucks where track loading machines are used and by caterpillar trucks in trackless areas. Each truck has mounted on it a small aerodyne midget fan for ventilation of the face, while undercutting and an essential part of the equipment carried is a hand auger drill for drilling the bolt holes in the floor. Some work has been done on removal of bug dust by mechanical devices, and two home-made units have been tested. Further work with units being developed by the manufacturers is contemplated.

Holes Drilled With Three Lengths of Steel

Jeffrey A6 post-mounted electric auger drills, 220-volt, AC, three-phase, are in general use in the district. Drilling speeds vary from 28 to 36 in. per minute and steel and bits wear is not excessive. Three lengths of steel serve to drill holes up to 11 ft. in depth. Generally, in the district holes are drilled in the common toe-hole pattern in vertical rows four ft. apart, each row containing three, four or five holes, depending on the height of the face, but at Potash Company of America due to a low height of seam a vertical V-cut round has been developed which involved fewer set-ups, but more holes drilled per set-up. Either of these rounds will pull the full depth, give satisfactory breakage, throw the ore away from the ribs, and leave little or no overhang in the face. At the start of operations at International, drilling in langbeinite, due to its hardness, was with wet jackhammer type drills used with a Mexican set-up. Langbeinite has the hardness of limestone and the same specific gravity but is considerably more brittle, however.

This was unsatisfactory because of solution of salt in the water used and the attendant danger of short circuits. Experimental work was done on alloy-tipped bits used with the Jeffrey auger drill and after nearly a year of work, Carboloy insert bits were adopted for all drilling in the mine at a substantial saving over the old air drilling methods on the langbeinite level and the old-type auger bits used on the lower level. The starter bit is 1⅞ in., the second bit 1¾ in. and the last bit 1⅝ in. in diameter.

Much care has to be exercised in spacing and pointing the holes, but after some practice, drillers have little difficulty. General practice is for the face boss to locate each one of the holes, and the position of the post by actual measurement. Just a matter of one or two inches off on these holes will result in a badly blasted ground because of the spongy character of the soil.

Blasting is done on graveyard shift at two of the mines, but at the end of each shift at International. Primers are made up underground and the shot firers or haulage crews haul powder and primers from the underground magazines to the faces in insulated cars equipped with insulated couplings. Holes are fired electrically and each round is connected in series. The shooting circuit is 220-volt AC and is taken off the transformer serving the section with power, but through a separate blasting line having locked switch boxes. Both du Pont and Hercules powders are in use in the district.

The du Pont powder is extra D (40 per cent Vol. Str.) and extra C (45 per cent Vol. Str.), while the Hercules powder is Hercomite 4 X (40 per cent Vol. Str.). Generally, primers are made up with unperforated sticks, all other powder being perforated, but one mine uses the perforated stick for the primer also. Blasting caps are No. 6, and delays through No. 6 are used in the district. Some use iron leg wires, which is taken out of the mill feed by magnets, while copper leg wires are used elsewhere. Tamping is used at United States Potash Company. Experimental work done to date on short-delay caps indicates a real advantage to be gained by their use through better fragmentation and reduced cost.

A Link-Belt rotary dump speeds the emptying of ore cars

Powder consumption is 0.6 lb. per ton in langbeinite, which is very brittle, and 0.75 lb. per ton in the more resilient sylvite. The top rib holes—that is, the hole in the outside corner at the top—have a tendency to collar unless loaded more heavily than the others. No shattering of pillars has been noted as the ore is so tough that breakage beyond the rib line does not take place.

Loading Methods Involve Various Types of Equipment

At present three types of mechanical loaders are in use: The Sullivan three-drum track-mounted scraper loaders, the Jeffrey L400 and L600 track-mounted machines, and the Joy 11 BU AC and 14 BU DC caterpillar-mounted loaders. The scraper type and track-mounted conveyor type machines load directly into mine cars, while the caterpillar type Joy machines load into Joy rubber-tired shuttle cars which in turn load into mine cars from ramps or by means of Joy elevating conveyors. The Sullivan scraper type machine is used where a limited number of faces may be loaded from one set-up of the machine in a shift. The Jeffrey L400 and L600 machines are used in development work as they may be moved over long distances with a minimum loss of time and are very satisfactory where development work is widely spread and several faces require loading in a shift. Using a single track in a development entry which must be kept well up the face at all times, the limit of width that can be cleaned is 23 to 24 ft. Cost of track work is high.

The Joy caterpillar-mounted machine has universal application in the mines at Carlsbad as it can load out rooms 36 ft. wide or entries 16 ft. wide with equal facility. The 11 BU is used in high faces, while the 14 BU can be used in faces as low as four ft. in height. It is desirable to locate these machines in panels where enough ore has been blasted on previous shifts to load the following two shifts, as it is not feasible to advance faces more than one cut per day. This procedure is necessary to insure adequate ventilation. When properly served, the Joy machine can load out 150 tons per hour of run of mine material, and it operates with equal facility in piles that are three ft. to 12 ft. in height. General practice is to go into the pile along the right rib with the operator standing on the right-hand side of the machine. He goes in standing between the rib and the machine. Then in successive slices he removes the pile from right to left across the face, to the right rib back out and takes another cut and back out and keeps on along the full width of face. Caving-in is no disadvantage when loading is done in this manner, and the machine may continue to dig itself out or it can be withdrawn to advance again, and the operator is always protected.

The machines are serviced at midshift, and preventative maintenance is practiced with the result that direct repair labor and materials have averaged about 3½ cents per ton over a period of six years. The average shift production of an 11 BU machine is 600 tons. That takes into account lunch hour and moving time and getting to the working place and back.

A low truck with removable ramps has been developed with which to transport the loader rapidly from one working area to another. This truck is hauled behind a shuttle car or behind one of the mine tractors. The loader delivers the ore into rubber-tired shuttle cars which shuttle between the face and raises on the 800 level and to ramps or elevating conveyors on the 900 level which deliver the load into mine cars. It is desirable to keep the haulage distance with shuttle cars to a limit of 500 ft. and up to this distance two or three shuttle cars will adequately serve the loader, that is, at the rate of 150 tons an hour. On the 900 level the 42D car is used, and batteries are changed once a shift at shift-change time.

At International's mine the 800 level has been equipped with a double overhead trolley system, and the shuttle cars are 42E type (seven-ton capacity) and 60E type (11-ton capacity). Now, 42E means 42 in. above the floor; 60E means 60 in. On this level hauls up to 2,500 ft. between the face and a raise have been maintained with remarkably little drop in the efficiency of loading, but on such hauls four shuttle cars are required to keep the loader occupied.

Trolley Locomotives Universal on Main Lines

At all the mines trolley locomotives are used for main line haulage. At United States Potash Company eight-ton trolley-cable reel locomotives in tandem are used on main line haulage, and eight-ton trolley-cable locomotives on gathering service.

At Potash Company of America main line trolley locomotives weigh 15 tons, and for gathering service the 12-ton battery-trolley locomotive is in use. International uses for main line haulage 20-ton trolley locomotives with gathering locomotives of 13 tons weight. Soon two 13-ton locomotives will be connected in tandem for main line service and the 20-ton locomotive will go into service as a gathering unit where severe grades exist. Miscellaneous work is performed with eight-ton locomotives, either trolley-cable

(*Concluded on page* 61)

Rubber tired vehicles are also entering the potash mining field. Here a Lee-Norse mine tractor draws a mining machine

The 1947

Coal Convention and Exposition

Plans Under Way For the First Full Scale Post-war Meeting of the Coal Industry

THE 23rd Annual Coal Convention and Exposition of the American Mining Congress will be held in the Auditorium at Cleveland, Ohio, May 12-15, 1947. The convention will be under the direction of George H. Love, president of the Pittsburgh Consolidation Coal Co., who will serve as national chairman of the program committee. This committee, consisting of leading operators and manufacturers from all coal fields, is now engaged in formulating the convention plans and arranging for speakers who will discuss subjects of widest interest to the industry.

For the first time since 1940, there will be an exposition of mining equipment; this will be the greatest display of coal mining machinery, equipment and supplies ever shown and will feature the latest post-war designs, as well as new improvements in standard models. The Cleveland Auditorium has adequate floor space to contain the entire range of machines, tools, supplies and repair parts for all phases of mine operation and maintenance, and the exhibit will show everything from the smallest devices to the heaviest types of equipment used for deep mining, strip mining and surface preparation.

The move from Cincinnati to Cleveland is necessitated by the lack of exposition space in Cincinnati; Music Hall, which so long served the industry, has been outgrown by modern developments and it would not be possible to show there all the classes of mining equipment now being manufactured. The Cleveland Auditorium has assembly room facilities for large general meetings as well as for small group gatherings and the plans for the 1947 convention and exposition will take the fullest advantage of the splendid opportunities offered.

GEORGE H. LOVE
National Chairman
Pres., Pittsburgh Consolidation Coal Co.

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Coal Mine Maintenance Organization

Man Failure Rather Than Mechanical Defects is Responsible for Most Breakdowns Today

By J. F. MAZZA
Manager of Maintenance
Rochester and Pittsburgh Coal Co.

ACCORDING to Webster, the definition of "maintenance" is: (1) Act of maintenance; (2) state of being maintained. While "organization" is defined as: (1) Act or process of organizing; (2) state or manner of being organized; organic structure. From these definitions we can easily arrive at the conclusion that a good maintenance organization depends on two basic laws: (1) To act; (2) to keep on acting. In other words, we cannot leave a maintenance organization to chance; we must act, and after the organization is set up (organize means to systemize) we must keep the organization alive with action, every day, every month, every year.

Who Causes Mechanical Failures?

Today approximately 50 per cent of our mines are highly mechanized; today we are asking one machine to do the work that was formerly done by 10 to 20 men. However, the success of that machine and its profitable production of coal depends upon "man," and that man who causes the breakdown can be anyone in the production or maintenance organization.

He can be the operator of the machine, who through carelessness, or even premeditated abuse causes it to fail. If he does not lubricate his equipment or take care of minor difficulties, major breakdowns are certain to result.

He can be the assistant foreman who permits his men to abuse their machines or who does not check, inspect, and test his equipment at periodic intervals for lubrication and repairs. Those who hog production to the detriment of good maintenance and those who permit rising costs through neglect of equipment are equally responsible. A foreman who fails to properly instruct his men and who furthermore neglects to follow up with personal supervision to make certain that his orders are carried out, is falling down on his job. One of his most important functions is that of cooperation with the maintenance supervisor and his mechanics to insure the proper operation of all equipment under his control.

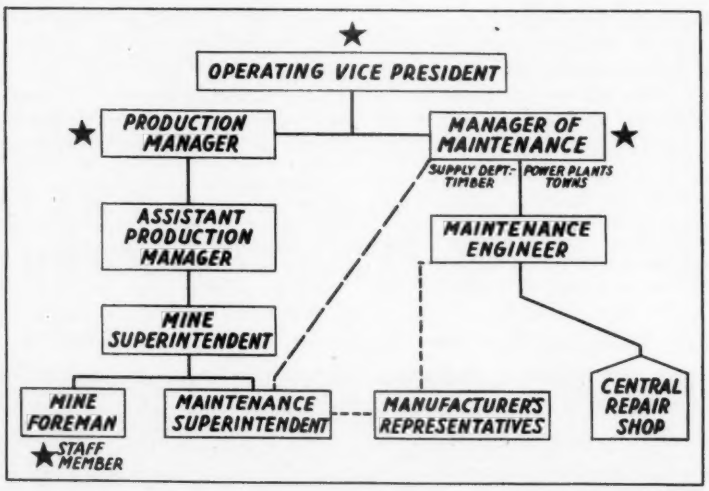
He can be the mine foreman or superintendent who does not fully appreciate or believe in the importance of maintenance as an economic measure. Those who do not prevail upon their assistant foremen to preach and practice the proper care of equipment are bound to suffer the consequences.

He can be the maintenance mechanic who does not take an interest in nor care for the proper operation of equipment under his care. Men should be chosen for this duty who have the necessary aptitude for mechanical work, who fully understand the duties required, and who are not careless in respect to details.

He can be the maintenance supervisor who does not cooperate with the superintendent, mine foreman, or the assistant foreman on good maintenance. It is his duty to advise them of the condition of their equipment. He should make periodic inspection of all machinery under his jurisdiction and furnish written reports to the proper authority. He should instruct properly all mechanics in making first-class repairs and he should not permit slipshod or makeshift expedients on the part of these mechanics.

He can be the supply clerk who fails to have the necessary material in his stockroom to keep the equipment in good repair. The purchasing agent who buys inferior material and parts, hoping to save a few cents and thereby losing dollars, is equally responsible for mechanical failure.

He can be the manager of maintenance who fails in his duty to see that all equipment is receiving adequate care. If he does not cooperate with the production manager or general superintendent and mine superintendents in preaching and practicing good maintenance, failure in mechanical equipment is bound to result. The manager who permits inferior lubricants to be used or who fails to keep abreast of the times, or who refuses to look into or adopt new ideas and equipment, is negligent by modern standards. An alert manager makes every effort to keep all men in his organization advised of new trends and ideas that may lead towards better maintenance as well as production.



He can be the production manager who is not "maintenance conscious," who hogs production to the detriment of equipment and who does not teach or practice maintenance. The setting up of a maintenance organization is of utmost importance and the production manager who does not insist upon the superintendents being maintenance-minded will sooner or later encounter a major breakdown with a resulting loss in tonnage. The production manager should insist on the availability of spare equipment at each mine so that machines can be

Presented at the Monongahela Valley Coal Mining Institute, Morgantown, W. Va., Sept. 10, 1946.

taken out of service for repairs without any loss in budgeted tonnage.

He can be the operating vice president who fails to have cooperation between his production manager and manager of maintenance. He must appreciate the importance of proper operation of equipment, and he must back up the requests of his assistants for new and better equipment. From this it is easy for one to realize that top management must assist in the plans of and definitely take part in the maintenance of equipment, and it must continue down the chain of command to the man at the face.

Maintenance Department Must be Organized

To put this idea across I have prepared a chart of our organization, showing the operating vice president as head of the production and maintenance departments. He depends on his manager of maintenance and production manager to operate the organization successfully. The production manager working through his assistant places the responsibility on the various mine superintendents. The mine superintendent in turn depends on the mine foreman and assistant mine foreman and the maintenance supervisor. The manager of maintenance works through the maintenance engineer and with the maintenance supervisor.

I would like to call particular attention to the manufacturer's representative on this chart and the part he plays in a good maintenance organization. When we first started with a small amount of equipment around the mines, this man was looked upon as a demonstrator and salesman, and by some management as a nuisance. However, today we definitely have him fitting into this picture and we recognize him to be a very important man in the proper functioning of this organization. The manufacturer's representative follows this procedure. First, he goes to the manager of maintenance's office and gets a permit to be on our properties for the purpose of contacting and aiding the maintenance supervisor and maintenance engineer in the proper inspection and listing of parts to repair a special piece of equipment, be it loader, cutting machine or locomotive. In order to explain this more fully, we will make a specific example.

How Maintenance is Carried Out

The maintenance supervisor at Mine "A" knows that his loading machine No. 5 must come out of production and be sent to the central repair shop for complete overhauling. Together with the manufacturer's representative and the maintenance engineer, they make an inspection of the loader, also talk to the operators of this equipment and arrive at the necessary parts to be ordered to properly rebuild this loader. The manufacturer's representative checks with his plant and gives the maintenance engineer a delivery date for the parts, which we will assume is November, 1946. The maintenance engineer then goes to the central repair shop superintendent and makes plans to have this loader in his shop, if it fits into his schedule, for a complete rebuilding on November 10. The maintenance engineer gives this date to the maintenance supervisor, who goes directly to the mine superintendent, and if he gives him the loader for November 10, then that machine comes out of production and is sent to the central machine shop for complete rebuilding.

This is fine if everything goes according to plan and schedule. However, if the superintendent does not agree or does not want to pull this loader out of production, he makes this story known through line organization to the production manager. The maintenance supervisor also makes the story known, with a copy of his letter to the manager of maintenance.

At this point the manager of maintenance and production manager discuss the question of this loader, and if they agree with the maintenance supervisor, then the orders are handed down that this machine must come out of production on November 10. However, if they should not agree, then they can have an audience with the operating vice president, who knowing the market conditions, will weigh the facts as to whether it would be advantageous to have poor and patch maintenance with some production from this loader, or to get this machine out so that we can have good maintenance and good production later, and his decision will be final. He may even authorize at this point the purchase of spare equipment so that we will be assured good maintenance and good production.

Importance of Lubrication

Assuming that everything went well and this loader is at the central machine shop on November 10, we also incorporate at this time a training program. If the maintenance supervisor feels that he has one or two mechanics who lubricate and work on this loader every day, are in need of further mechanical training, we arrange with the superintendent of the central machine shop to have these mechanics at the shop to help tear this loader down and rebuild it, bearing in mind that the expert mechanics at the shop will instruct them thoroughly in good lubrication and good daily maintenance.

We all agree that good lubrication is most important, and that is why I again want to refer to the manufacturer's representative. This time we will call him a lubrication engineer. The maintenance supervisor having equipment that must be properly lubricated, and if he feels that the quality of lubricant that he is using is not satisfactory, he goes directly to the maintenance engineer for advice. The maintenance engineer counsels with the manager of maintenance, and if necessary, we bring in the lubrication engineer, and we have him work with the maintenance engineer and maintenance supervisor at the mine. They may try one or more grades of lubricant until they agree on the right type for this equipment. I am using this example to show how again and again the manufacturer's representative fits into our picture.

In conclusion, I would like to say that our maintenance organization has gone through the fire, and today it is highly successful, but we are all agreed that the secret of its success is due to the interest and cooperation of everyone in our company, from the president down to the miner at the face. We have not, however, relaxed our vigilance for even a minute, rather are we striving for perfection in every phase and will not stop until we reach it.

Mechanical Mucking In Vertical Shaft Sinking

The Use of Mechanical Equipment May Revolutionize One of the Most Difficult Tasks in Mine Development

By GEORGE M. GRISMER

Superintendent
Polaris Mining Company

GENERALLY, the most difficult, expensive and time-consuming job in mining is shaft sinking. During the years just passed, much thought has been given to the improvement of underground working methods in order to maintain production with skeleton crews. Many of these improved methods were applied to shaft work. For instance, automatic machines, pneumatic bars, new and faster methods of installing air and ventilation pipe lines, and the lowering and placing of timber were adapted, but with all of these improvements there remained at the bottom of the shaft the toughest job of all, the muck pile. It is well known that hand mucking in a vertical shaft is one of the most arduous physical jobs in mining. Maybe that is why there are so few experienced shaft miners today.

During recent times many endeavors have been made to mechanize the mucking operation. In long narrow shafts scrapers, slides and tugger hoists have been used to partial advantage. In other shafts muck trays, filled by hand, and subsequently hoisted and dumped into a skip, or a car on a cage, has reduced the burden somewhat. Drift-type loading equipment has been tried. Many trials have been made by equipment resembling the "dipper and stick" of power shovel excavators and actuated by air hoists. Within the past three years the clamshell method has been introduced.

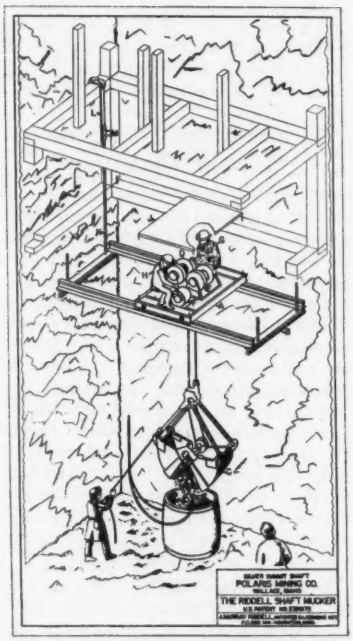
In order to overcome previous disadvantages and to speed shaft work, there was conceived, developed and patented, during 1942, a mechanical shaft excavator known as "The Riddell Shaft Mucker." When plans were first made by the Polaris Mining Company to deepen the Silver Summit shaft an additional 1,500 ft. plus adequate depth for sump, L. E. Hanley, president and manager of the Polaris Mining Company, investigated the possibility of adapting "The Riddell Mucker" to the job. After a study of the contemplated work by J. Murray Riddell, and upon his recommendation, it was decided to use the machine for the work.

The "Riddell Mucker" Starts Operation

On February 1, 1946, sinking was begun and the machine was put into operation after the fourth blast. Two experienced operators arrived to assist in the installation and first operation of the mucker. Since the operation of the machine is very simple, additional operators were broken in, and within a few weeks there were men on each shift capable of competently handling the apparatus.

The general features of design of "The Riddell Shaft Mucker," as applied to the Silver Summit shaft of the Polaris Mining Company, are shown by the accompanying drawing. The mechanism consists essentially of three principal parts: (1) a carriage, A; (2) a frame, B; and (3) a clamshell bucket, C.

As for the carriage: It moves horizontally, in either direction, along the long axis of the shaft. The chassis is made of structural steel members which are fastened together by bolts, rivets, and welding. At the four corners there are flanged wheels which engage the frame. The front two opposite wheels are keyed to a common connecting shaft on which there is also keyed a chain sprocket wheel. The back two wheels have separate stub shafts.



The simplicity of the Riddell shaft mucker is easily seen from this diagram

Mounted on the carriage are three Gardner - Denver compressed air-driven motors. Motors D and E, type HMK, single drum, care for the operation of the clamshell bucket, one serving the digging line and the other the hoisting line. Motor F, type MBH, reversible geared, is the unit which actuates the movement of the carriage by means of chain drive and sprocket wheels.

Suitable piping, fitted with airline lubricators, all of which are attached to the carriage, serve to feed compressed air to the motors. From the end of the pipeline a rubber hose, 1½ in. in diameter and of suitable length, connects to the main header.

Fastened to the carriage are rail guards, which prevent derailment.

Two Operators Run the Shaft Mucker

Two men ride the carriage, G and H. G cares for the operation of the clamshell. H moves the carriage horizontally. The bell signal line to the hoist engineer is cared for by H

or one of the men at the bottom of the shaft.

Operators G and H work beneath a light metal cover, J, which serves the dual protective purpose of deflecting water and other free-falling objects. This covering is supported by a light framework which is attached to the carriage; it can be easily removed.

The frame, B, is made of 112-lb. standard "heavy" rail section. Its outside dimensions are slightly less than the interior measurements of the shaft set, 14 ft. 2 in. by 5 ft. 6 in. Such an arrangement permits the placing of the frame and carriage within the timbered portion of the shaft or beneath. When the frame is carried within the timbered portion of the shaft it is naturally necessary to delay the placing of the dividers of the lower shaft set.

Attached to the corners of the frame are four hanging rods, K, which in turn are bolted to U-shaped hangers, L, which straddle the end pieces of the shaft sets.

When it is necessary to lower the frame and carriage to a new position, the following procedure is followed: First, the clamshell is placed on the bottom of the shaft. Then the carriage is placed and locked at the center of gravity of the combined carriage and frame. Four clevises, with wire rope and hook attachments, are then fastened to the frame at points near the four corners of the carriage; the hooks are then attached to the rim of the muck bucket which serves the center compartment of the shaft. The hoist engineer is then signaled to "make taut" the hoisting rope and raise the apparatus just sufficient to turn the U-shaped hangers and hanging rods half way around. Subsequently the hoist engineer is signaled to lower the frame and carriage to approximately 1 ft. above the next working level; then the U-shaped hangers are turned to their original position, and the frame and carriage lowered to the desired new working position. A 6-in. by 10-in. timber 5 ft. in length is then placed across the tops of the U-shaped hangers at both ends of the shaft. Chains are fastened and securely wedged over these timbers and around the end pieces of the shaft set. This is done to prevent the impact of blasting from lifting the frame and unhooking the hangers. Safety chains are placed around the frame of the machine and end pieces of the shaft to prevent the machine from falling should a hanging rod break while the machine is in operation. The required time for changing positions is approximately 12 minutes.

The clamshell bucket used was made by the Blaw-Knox Company. It is of the "hard digging" type; capacity, ⅜ cu. yd.; equipped with front, side, and corner teeth; width, 20 in.; length, open, 6 ft. 0 in.; weight, 2,020 lbs.

The 1½-in. diameter air hose which serves for the operation of the motors is also made use of for drilling by attaching it to a manifold.

The mucker was placed in service on February 3, 1946. The dependability factor of the mucker is approximately 99 per cent.

The shaft is being sunk in quartzite. The dip of the formation has varied from 45° to 90°; the strike from diagonaling to paralleling the short axis of the shaft.

In the Silver Summit shaft, the so-called bench type of cut is used. Since the shaft is of 9-ft. by 18-ft. untimbered dimensions, 36 holes, varying in lengths from 6 ft. to 7 ft., per bench round are required. Drilling, which takes from two to two and a half hours, is done with three Ingersoll-Rand DA-35 power-fed drifters with sliding cones mounted on a 3½-in. pneumatic column bar. This method of drilling is believed superior to conventional hand-held machines. The explosive consumption is approximately 40 lbs. of 40 per cent weight strength gelatin per foot of shaft sunk. One and one-eighth in. round hollow steel with detachable Timken type M bits is used.

No Hand Shoveling Required

After the round is blasted, approximately one hour is required to blow air into the shaft bottom and to draw smoke and gas therefrom. About 15 minutes are spent cleaning broken rock from the shaft timbers, unhooking the clam, making hose connections and preparing the mucker for operation. Thirty cu. ft. sinking buckets with ball and chain attachments are used. The time required to fill the bucket varies from 1½ to 2 minutes, depending upon the operator's skill and the fineness of the muck. No muck is hand-shoveled into the bucket.

About 5 gals. per minute of free falling water reach the bottom of the shaft. During timbering and subsequent mucking operations it is not necessary to do any pumping as the clamshell serves to bale the water into the muck bucket along with the muck. A limited amount of pumping is required while drilling.

A 250-hp. double drum, clutched, electric hoist, with a rope speed of 800 ft. per minute, is used. Because of the distance the muck must be hoisted, the mucking operations are slowed down. The time required at this time to muck out a bench round of about 30 buckets is three hours.

Each hoisting compartment is equipped with a cage. Attached to the bottom of each cage, near the guides, are two ⅝-in. chains of 30-ft. length. The chains attached to the diametrically opposite sides of the muck bucket. With ample headroom for dumping, this practice has advantages over the conventional type of baled muck bucket with crosshead.

New Record Made for Shaft Sinking in Coeur d'Alene

Since the beginning, and between the interval February 1 to September 1, 1,040 ft. of timbered shaft have been completed, and stations cut on the 2,000-ft. and 2,500-ft. levels. By maintaining progress at approximately the present rate, the shaft will be completed by December 1.

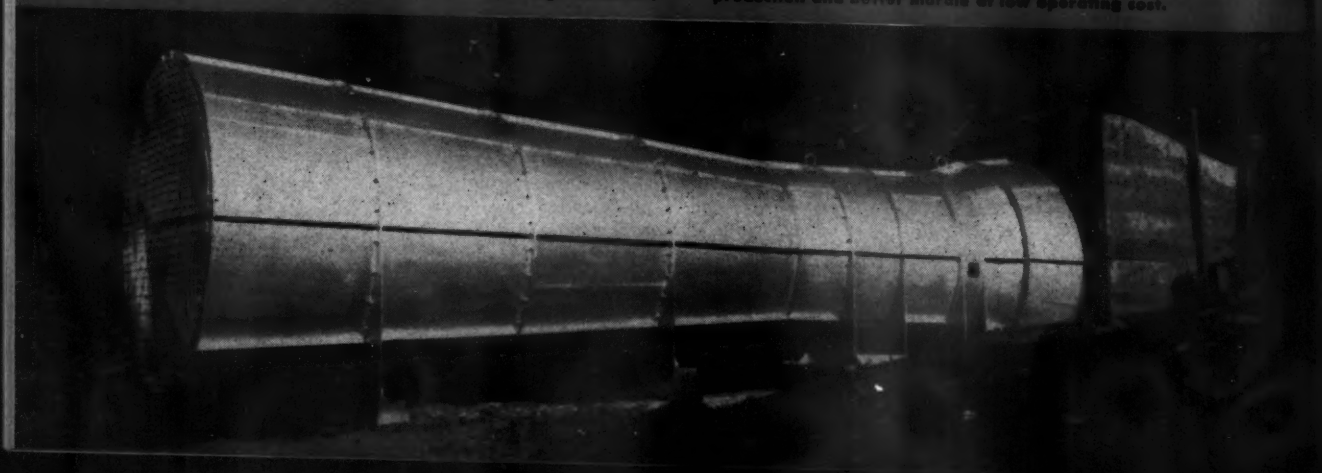
Working three shifts per day during the month of July, with 5 men per shift in the bottom, 35 sets, or 183.75 ft. of timbered shaft were completed. This set a new record in the Coeur d'Alene District. The shaft sets are spaced at 5-ft. 3-in. centers. During August, 158 ft. of timbered shaft were sunk, plus the cutting of a shaft station.

Beneath the collar of the shaft all work is cared for by one shaft foreman, three shift bosses, and 12 shaftmen. The working schedule is on a 7-day-per-week basis, three 8-hour shifts per day. The shifts rotate at the end of each week. At present, a complete cycle consumes about 20 hours.

When the mucker was first installed the men were frankly skeptical of its worth, but after a very short time they were its most enthusiastic boosters. I venture to say that should we remove the machine now we would have to find an entire new shaft crew. I am also convinced that having the machine has kept our labor turnover at a minimum.

From the standpoint of the men and the company, mechanical shaft mucking as practiced at the Silver Summit shaft is a complete success.

Below is a La Del Yrotor high pressure Vane-Axial flow fan, 5' diameter, coupled to a drift opening. Circulates pure, fresh air in mine workings to promote safety, greater production and better morale at low operating cost.



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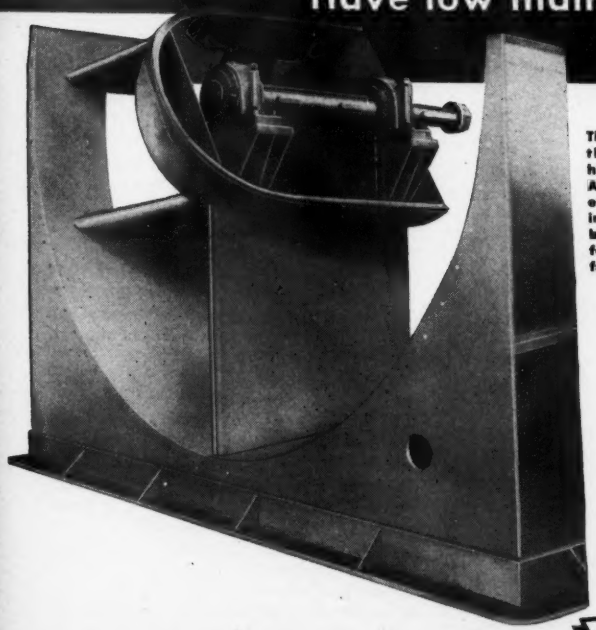

The split nosing on this 10′ diameter high pressure Vane-Axial flow fan affords easy access to bearings and shaft assembly. Streamlined belt fairings protect belts from the air stream.

The complete rotor assembly of a 10′ diameter high pressure fan shows how adjustable pitch propeller blades are statically balanced on specially designed La Del machines.

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The Future of Gold

The Value of Gold Will Remain a Universal Standard. The Gold Mining Industry is Best Served by Avoiding Inflation and the Tampering with Paper Currency

★

By DONALD H. McLAUGHLIN

President
Homestake Mining Co.

★

ACCEPTANCE of gold as a token of inherent value is so common a characteristic of all manner of men that there is scarcely any part of the world in which an individual possessing gold would not be able to exchange it advantageously for the goods or services he desired. This is not theory; it is simply an observation of a human trait that comes as near to being a law as anything can in the social sciences. Consequently, gold is trusted as a basis of exchange and as a measure of the value of currencies to a degree that is not even approached by any other means. Confidence in gold far exceeds confidence in governments, and possession of gold is rightly regarded as a better security for wealth than the holding of promissory notes.

When not restricted by arbitrary political controls and limitations on trade, the purchasing power of gold is stable over wide regions. It may be temporarily altered by artificial deprotect a people from the disasters vices and it is subject to slow changes in response to the available supply and to the demands upon it, but by and large the value of gold possesses a momentum that carries it along a regular course with a steadiness that forces other units of value to adjust themselves to it on its own terms.

The profound dislocations in the world's economic order that lead to wild fluctuation in the value of paper currencies and to the excesses of the printing press are not the fault of gold, nor can they be corrected by gold alone. In the post-war periods, it was not gold but paper currencies that lost their virtue. Surely it was no reflection on gold that its value in German marks went to a fantastic figure; or today its value in Hungarian pengos. No rigid standard can resulting from losses in war, from dislocated trade, and from their own economic follies, but the existence of gold as an international measure of value, even though at times it may be somewhat in the background, exerts a restraining and stabilizing influence that in the end tends to restore financial sanity after the most drastic disturbances.

In comparison with artificial units, such as the commodity dollar or other strange creations based on economic indices of one sort or another, gold has the supreme virtue of tangible existence and traditional value that make it resistant to political manipulation and not exclusively dependent on definitions and agreements that are apt to become scraps of paper when they run counter to national expediencies.

The gold miners these days may have their troubles, but in my judgment they need have no fears about the steady persistence of demand for their product. The world will continue to want it and over the years will undoubtedly continue to pay enough for it to keep gold mining active and attractive for new ventures as well as profitable for established and stable operations.

Gold Supply and Price

In the late 1920's, much concern was expressed over the possible failure of the gold supply to grow at a

rate commensurate with the expansion of money needed for the rapidly increasing industrial and commercial activities of the world. Decreasing grade and rising costs with deeper mining in the Witwatersrand were beginning to create doubt about the maintenance of the output of this leading gold field, and the new gold from Canada's growing mines seemed hardly enough to offset the expected decline in the older fields. In conjunction with these conditions came the sudden enlargement of debts during the First World War, the dislocation of certain of the dominant currencies, the fluctuation of the business cycle on an intemperate scale, and above all the blind insistence of the major creditor of the world, the United States, to maintain a so-called favorable balance of trade. From our present point of view, an adjustment of the currencies of that period to the realities of gold in the face of these disturbances now appears to have been unavoidable. The old gold standard, though admirably suited to meet the needs of closely balanced multilateral trade in the well-ordered world that preceded the war, simply could not correct the excesses of the new times; and the function of gold had to be redefined in less rigid terms.

The fixing of the price of gold at $35 per ounce by the United States Government in January, 1934, proved to be a fortunate level though I am inclined to think that more luck than wisdom was involved in the selection of this particular figure. At the time it was apparently expected that the cheapening of the dollar in terms of gold would bring about a greatly desired increase in domestic prices, but as is now well known the change had little or no influence on them. On the other hand, the effect on international exchange and prices in foreign trade was prompt and drastic.

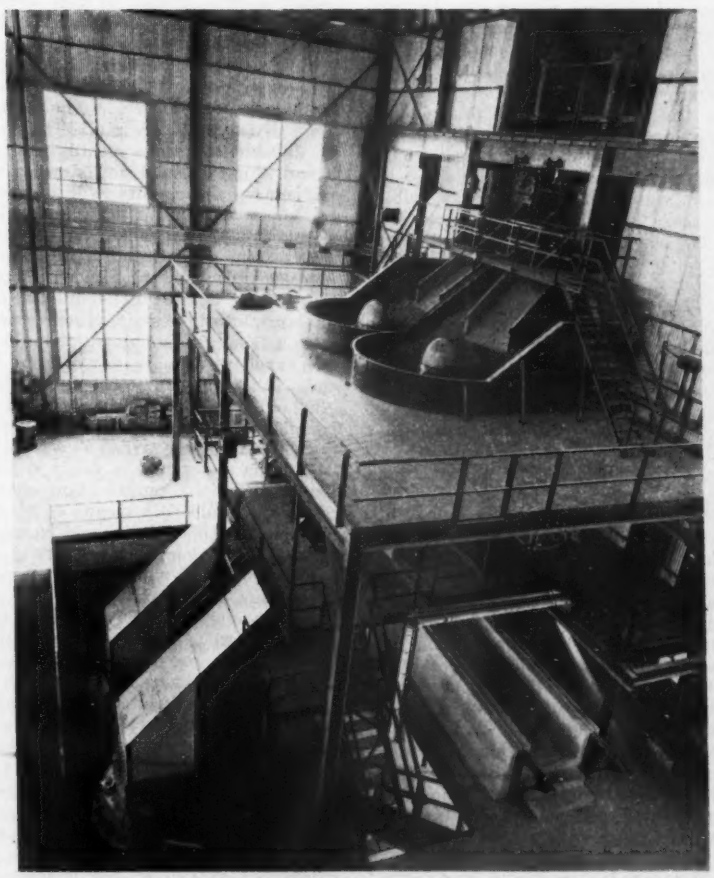
In response to these widespread efforts, world production rose from about 20,900,000 oz. in 1930 to close to 41,000,000 oz. in 1940. This increase was indeed spectacular and probably would have been adequate to meet the peculiar demands of the times if it had not been for the still more profound disturbances and inflations resulting from the second war.

The spread between the price of gold and the cost of mining and recovering it from its ores that prevailed in the period between 1934 and 1941 was enough to attract money into new ventures and to promote exploration and mine development throughout the world on a scale that removed all danger of shortage of ore for some decades, yet created no threat to the value of gold through overproduction. The increased output seemed about in balance with the world needs until the vast increase in paper money, the shortages of goods, and the drop in gold production resulting from the closing of mines in the United States and from lack of labor and materials in other fields, as well as the restrictions on sale of gold, exchange controls and abnormal trade conditions in nearly every country during the Second World War, again disturbed the equilibrium and raised new doubts as to the ultimate value of the world's paper currencies. There now seems abundant indication that gold is preferred even to dollars at the present Treasury price, and that unless there is marked change in the factors listed above, even the strongest paper currencies may be forced eventually to recognize a higher price for gold.

Movement of Gold To and From the United States

An even more spectacular result of the increase in the price of gold in 1934, however, was the effect on international exchange. Through it, more dollars could be purchased for a unit of foreign gold, and, as domestic prices had not risen, our goods and services were at bargain levels in foreign currencies. Gold immediately commenced to flow to the United States at an accelerated rate and continued to do so until checked by lend-lease agreements, which postponed and effectively wrote off whatever settlements might normally have been expected.

At its peak in 1941 our gold stock amounted to about 650,000,000 oz., upon which a value of 22.8 billion dollars was placed. In this immense sum was included the original value of the gold held in 1933 plus a profit of $2,800,000,000 from the write-up, as well as the profit on the gold collected from private holdings for which the Treasury paid $20.67 per ounce but entered on its books at $35. (Whatever "benefits" the gold miners received in the first years after the devaluation of the dollar were surely small in comparison with the "profits" the Treasury took into account!) In addition to this, however, gold amounting to about $14 billion was acquired between 1934 and 1941. Some $1,200,000,000 was obtained from domestic mines, but the rest came from abroad, of which $4,917,000,000 was in settlement for the excess of exports over imports during these years. Most of



Gyratory crushers handle large tonnages at Homestake

the balance prior to the war was refugee money, which for the most part could be regarded as claims against our wealth in one form or another. As war purchases increased, however, these foreign claims were reduced and eventually the bulk of the bullion from abroad could properly be regarded as a measure of the value of the tangible assets—machinery, metals, oil, cotton, foods and other real property—with which we had actually parted.

In many ways this was truly the most fabulous investment in history. As a measure of its magnitude, it is worth noting that 22.8 billion dollars is comparable to the gross value of the entire output of metals from all the mining districts of the West. In a sense, this great store of gold might be regarded as a reserve for the depletion that our mineral deposits have sustained to date.

As an investment, it makes sense only if the gold eventually will be accepted for goods and services comparable in value to those we gave up to acquire it. Obviously, it is vital to us to preserve the power of gold to restore the wealth for which it stands.

After the lend-lease agreements reduced wartime settlements to relatively low levels, our large purchases of metals and other strategic materials principally from Latin American countries created claims against us for which gold at $35 per ounce was accepted without question, and I am inclined to think even with enthusiasm. Some 2.5 billions of our gold was used in this way, which appears to be the chief reason why our total stock declined from a high of $22.8 billions in 1941 to about $20.2 billions at present.

The recent decrease in our gold holdings is even more pronounced when considered in relation to the world's total stock. Since the beginning of the war, the mines of the world have produced about 240,000,000 oz. of gold, worth $8,400,000,000 at $35 per ounce. Of this quantity of gold, the nations outside the United States appear to have absorbed $5.8 billions in addition to the $2.5 billions released from our stocks, a total amounting to $8.3 billions at the valuation we place on it. At its high point in 1941, the Treasury's holdings amounted to around 68 per cent of the total reserves of the world. This has now dropped to about 42 per cent, which is a shift of real magnitude. The willingness of others to accept this quantity of gold, probably in part at a higher price than the standard bid of the United States Treasury, is an unmistakable sign of the strength of gold in terms of the paper currencies.

In the long run, the value of our gold will be best protected by allowing it to function as a medium of exchange instead of a means of storing inactive wealth. If we follow the same policies that prevailed after the First World War—and to date they seem much the same—we shall have the choice of parting with our goods for paper, or making an even more outright gift of them, or accepting gold at some price that makes our goods reasonably competitive in the world's markets. Carried to an extreme, such a procedure results in impoverishment or on a naive dependence on storage of wealth in gold. It is no indication of lack of confidence in gold to feel that excessive accumulation through one-sided trade inhibits its true function. A situation of this sort tends to promote devices such as the restricted trade agreements and barter promoted by the Nazis and now by their successors, the Soviets. Although this would probably do no harm to the ultimate value of gold, it might during a critical period seriously lessen the effectiveness of *our* gold. The only safe solution is preservation and strengthening of truly multilateral trade.

For a creditor nation, such as we have been for more than a quarter century, the only policy that makes sense, as the British so well demonstrated in the sane decades that preceded the First World War, is to import goods or to employ services of greater value than those we export or perform for others. The adjustment of tariffs to accomplish this will be difficult both economically and politically, but if such adjustments are not made, the results will certainly be more painful in the end. We should recognize what the country needs from abroad and take steps to increase the flow of such goods to the United States. The building up of large stockpiles of minerals and metals from foreign sources would be one excellent way to accomplish this end. It would tend to check excessive gold imports and would be of mutual benefit to all participants in trade. Such stockpiles, regarded as a reserve, would not constitute a drain on the resources of the country but, on the contrary, would be a means of restoring our wealth, which would be wiser than placing complete reliance upon storage of gold, which could become precarious when too largely concentrated in one place. Such stockpiles from foreign sources, on a scale far greater than provided in the recent bill, would do much to stabilize trade, and, if carefully held off our domestic market except in times of urgent need, would in no way constitute a threat to our domestic mining enterprises.

A renewal of the heavy flow of gold to the United States, however, is unlikely in the immediate future simply because we are lending or otherwise providing the necessary dollars. When we have again grown tired of accepting paper promises in payment for our goods and are once more disinclined to give our resources away for nothing, we shall again have the alternative of accepting what foreign nations have to sell us or acquiring gold. If we maintain tariffs that restrict imports and still insist on maintaining our exports at a high level, the answer will be simple. We must take gold; and if purchasers abroad are to be found, paper dollars will have to be valued in gold at a price that puts our goods within competitive range.

The Current State of Gold Mining

As gold producers we are, of course, primarily concerned with the spread between the price we receive for our metal and the cost of mining and extracting it from the ores. Traditionally, the spread is greatest and profits are best in times of depression, when labor is plentiful and most efficient, and the cost of supplies and equipment required for the operations is low; and the present difficulties of the gold miners are in line with the reverse of this pattern. Inevitably, profits throughout the entire industry decline and marginal producers suffer so acutely in times like the present that consideration of measures for relief is properly called for.

Means of improving the state of the industry range from action of purely domestic character, entirely within the control of our own Government, to adjustments of currencies to the value of gold that inevitably involve foreign exchange and international trade in ways that are now too vital to other nations to permit us to move with complete independence, especially since the commitments of Bretton Woods.

Steps that might be taken domestically include (1) technical improvements to reduce costs, and to improve recoveries; (2) a premium price for gold produced from our own mines; and (3) relief from excessive tax burdens.

Advice to the gold miners to cut their costs by economies and by technical improvements is likely to be regarded as gratuitous under the circumstances that prevail. Naturally, all such means of survival will be sought, and it is surely a time when a wise manager must emphasize to all on his staff the need for greater efficiency and reduction of costs.

A premium price could undoubtedly be paid for gold from domestic mines without influencing the value of the dollar, either in foreign exchange or in terms of prices within the country. Action of this sort was taken in Australia to assist gold miners during their lean years in the twenties, which

led to the preservation of many small operations that became profitable producers and taxpayers in the thirties during the opposite swing in the economic cycle, when it proved decidedly beneficial to the country to have such mines in full production.

In mentioning that relief of this sort might be considered, however, I cannot refrain from observing that payment of special premium prices to marginal producers of any metal seems basically wrong in a free economy such as most of us would like to have restored in America. With such privileges inevitably go restrictions and administrative controls that in the end leave the miner not nearly as well off as he would have been if normal prices had been allowed to prevail.

A stronger case can be made for relief for gold mining enterprises through adjustment of the tax burdens that are now so excessive on an industry based on a wasting asset. The Federal income tax law now recognizes the principle of depletion, but its provisions for depletion deductions are on the meager side and are so restricted by intricate departmental rulings that their benefits are actually denied under some circumstances when they are most seriously needed. Furthermore, with the double taxation of profits, first by the tax paid by the corporation on its income and secondly by the tax paid by the stockholders on the dividends they receive from the same income, the final return is so reduced that the ultimate income from few mining investments today is enough to provide for restoration of the capital within the estimated life of the ore reserves and for interest at a rate commensurate with the risk involved. Under such conditions, what incentive is there to put money into development of new mines? Correction of these two matters—viz., (1) revision of the regulations to remove certain highly technical restrictions on the calculation of depletion allowances and (2) elimination of double taxation—would go far toward keeping our gold mining industry in a healthy condition.

Possible means of relief for the gold miners of the country that would inevitably involve international relations are (1) an increase in the price in paper dollars paid for gold by the U. S. Treasury, (2) coinage of gold at some stated price with permission to citizens to acquire and to hold it, and (3) granting of permits for exportation of gold, or of currently produced gold, for sale abroad at whatever price above the Treasury price it would command.

Various aspects bearing on the first question, i.e., an increase in the Treasury price of gold, have been already considered. Such a step at present would be regarded as inflationary by most officials and economists, and, although it would probably have no more effect on domestic prices than did the change from $20.67 per ounce to $35 in 1934, it seems highly improbable that such a move would be given serious consideration under the domestic conditions that now prevail. When the change was made before, it should be remembered that prices were low and the administration greatly desired that they should rise. Furthermore, the need for stimulating our exports through cheapening the dollar is still remote and not likely to become acute until foreign credits become depleted or our goods for export become far more abundant. When these conditions do arise, an increase in price of gold in paper dollars may well occur, but that does not seem to me to be likely in the near future.

Circulation of gold in coins would be a most interesting experiment, for it would promptly reveal where paper currencies stood in relation to gold. Gold at present is sufficiently plentiful to permit a substantial part of it to be coined without hardship. If issued at a fair price in terms of paper currencies, it should remain in circulation; and, if hoarded, it should be regarded as fair warning of the weakness of the paper and a sign of the need to correct the basic factors that create such weaknesses. Gold coins usually command a higher price than gold in bars in most foreign markets, as the Bank of Mexico with its usual foresight seems to understand. A premium on gold dollars in foreign exchange would not be unlikely, if the gold in the new coins were priced at $35; and it is probable that even the diminished $20 gold pieces (which would be only slightly larger than our old $10 coins at the same fineness) would tend to be hoarded.

Perhaps a better scheme would be to coin gold in new units with no fixed rating in dollars. An ounce of gold in such form might be called a Franklin or a Morgenthau unless some other name could be found that would be more generally acceptable. If such coins were made available at whatever higher price than current official rates they might command, and if free interchange between countries were allowed, the relative levels of the world's paper currencies should become apparent. Such an adjustment by reference to a common standard would promote a base upon which a satisfactory degree of stabilization might be achieved, if effective disciplines in international trade and finance were then agreed upon and put into practice by the major nations. Possibly few governments today would dare face such an honest challenge, but efforts to hold paper currencies at present ratios without reference to some widely trusted and impartial standard seems to me to be as futile as efforts to stabilize the finances of a weak country by loans that do not correct the basic troubles of the times. Free circulation of gold coins might well provide just the frame of reference that is needed for determining equitable levels to which foreign exchanges could be adjusted by appropriate means. Indeed the coinage and circulation of gold for such beneficial ends as well as for the psychological value of having gold seen and handled again in human transaction has much to commend it.

Sale of Gold Abroad

Gold outside the United States, either as coin or bullion, appears to command a price today that is effectively higher than the U. S. Treasury price of $35 per ounce and even with the restrictions imposed by duties, by exchange controls, and by the quantities that could be absorbed as well as export-import policies in most countries, American producers could possibly obtain some benefits if they were allowed to export their gold and sell it abroad.

License for the export of gold from the United States may be obtained today only if the gold is to be used for industrial purposes. The purchaser must be known and submit a statement from an American consul with regard to the use that is to be made of the gold. Furthermore, the seller must guarantee that the purchaser will use the metal only for the stated purposes. The sales are at the Treasury price and the volume is small.

Sixteen countries today permit private gold holdings and gold trade within their borders. Transactions in gold by individuals across international boundaries, however, is illegal in all countries, and where a government or a central bank does not retain a monopoly over gold import and export, industrial users may import only under a strict license.

The following countries have a *domestic* market in gold, which might be called open though subject in most cases to some restrictions:

British India	Turkey
Egypt	Greece
Iran	China
Iraq	Argentina
Lebanon	Brazil
Palestine	Chile
Syria	Cuba
Tran Jordan	Mexico

Prices paid for gold in the currency of these countries are far beyond the United States level of $35 per ounce at the official rates of exchange for dollars. Many of these governments have endeavored to convert the large funds of paper money in the hands of the people into gold at some offered

rate. In Greece gold recently was worth $110 per ounce (based on the sale in Grecian paper money valued in paper dollars at the official rate of exchange); in Lebanon $65 to $75; in India, the price has been as high as $88.77 per ounce but there, as elsewhere, a recession has taken place, recent quotations are around $72.71. In Alexandria the price dropped from $74.23 July 5 to $72.50 on July 15.

Loading a car with gold ore at Homestake

The drop in price of gold was occasioned by sales by the Bank of Mexico, which currently is the world's largest seller of gold, at a price equivalent to $40.53 per ounce. Only purchasers abroad who are able to acquire the necessary foreign exchange can avail themselves of this opportunity, but the offerings had the effect of depressing the price of gold in the free markets of Bombay and Alexandria.

The gold producer in Mexico, however, does not benefit by this price for he must sell to the Bank of Mexico at the equivalent of $35 per ounce. He, as well as others, could then purchase gold for $40.53 per ounce for domestic hoarding or for export to a market where it might command a still higher price, but the bank takes the first profit on the transaction. (Clearly these days the miner is in the wrong business, when it comes to making a little extra profit from his own metals!)

In most cases, an American gold producer, even if the Government granted special permits to sell abroad, would be unable to obtain dollars by such a transaction, on account of the foreign exchange restrictions that prevail and the shortage of dollars in most countries where gold might be purchased. The seller might indeed obtain a high price for his gold in the local currency, but would then be faced with the difficulties of converting it into dollars. About the only way this could be accomplished is through the purchase of goods abroad and their sale to purchasers in the United States.

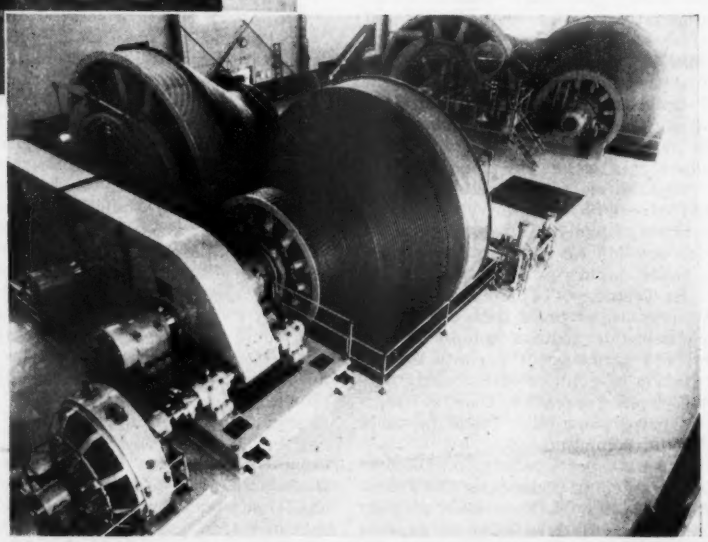
Just how much gold foreign markets would absorb in this way is difficult to predict. The present sales by the Bank of Mexico, which has available not only the output of Mexican mines but the earmarked gold to its credit in the United States, will afford very interesting data on this and other questions related to the world price of gold.

Conclusion

Although gold miners today may feel more confident than ever about the long-range future value of gold, both in relation to paper currencies and in terms of commodities and services that it will command, they also realize all too keenly that the times immediately ahead are certain to be hard. Pinched between rising costs and a price fixed by more rigid controls than even the OPA can impose, the immediate future is inevitably difficult and will remain so until the next depression, unless relief of some special sort is obtained.

An increase in the price of gold is not likely to appeal to many in power while inflation is being fought on the domestic front, nor is it probable as long as ample foreign credits are available through loans or more or less concealed gifts, for through them

(*Continued on page* 61)



Hoists of modern design serve the Yates Shaft at the Homestake mine at Lead, S. Dak.

Profitable Coal Production By Continuous Face Mining

By RICHARD A. SUPPES
Charleston, W. Va.

Based on Many Years of Mechanical Mining Experience in the Appalachian Coal Fields, Mr. Suppes Forecasts Radical Improvements in Methods and Equipment

UNTIL the conclusion of the recent World War it was necessary to use to the fullest, the skill and technique in coal mining already developed and perfected in prior years. It was quite right to obtain tonnage from the systems and methods at hand as there was little time for developing anything else; in fact, the improvements in mining reached at the start of the war contributed largely towards the immense tonnage essential in that emergency. It is not too much to say that the vision and progressive disposition of the industry turned out profitably for the whole general welfare.

Our country has grown great by improvements in mechanical technique and better methods have ever been sought as a means to a necessary profit. The time is here again to take up the further development of mechanization which holds an opportunity for the cheaper production which will be required in the future.

Higher Mining Costs Are Faced

The coal industry is faced with competition from oil and natural gas, to which can be added that of water power. This competition can well be more severe in the future than it has been in the past. Rates of pay are high and more likely to be increased than decreased; social benefits must be supported in a larger measure than ever before at an additional expense; the hazardous nature of coal mining must continue to be reckoned with, and, at ever increasing cost; advances toward better working and living conditions will also be made. Timber has suddenly become a scarce and costly article in many districts. The highest and best quality coal reserves, with the most desirable mining conditions, have already been worked over and in many places completely exhausted, leaving the next best for mining during the period which lies ahead.

All these conditions have the tendency to make coal mining more expensive than ever before, but the inductry naturally wants to continue to be profitable in its own right, without subsidy of any kind. To do this it appears necessary to take up further mechanical development without delay.

Greater Extraction to Reduce Costs

While in some districts natural conditions have allowed full extraction of coal by mechanical means already available, in others only the advance mining has been done, with complete extraction pending the perfection of machinery which would make practical and economical the recovery of the balance on a retreat system. These unmined areas can be held as very valuable, and may be looked upon as a stock, holding a comparatively large reserve of quality product awaiting recovery by a capable mechanical method.

The industry as a whole may probably be thought of as backward in its ability to succeed in mechanizing pillar work. The task has ever been a difficult one and will continue to be the subject for careful consideration and experiment. The fact that in many districts there are large areas of mine workings, open and subject to examination and study, gives favorable opportunity for studies on pillar drawing mechanical methods. At least many conditions are exposed and speculation is reduced to an extent which can be used to advantage. The equipment needed to prepare areas of this kind and do the dead-work for final extraction of the coal is already available.

The better principle, no doubt, is to do mechanical first mining first, immediately followed by mechanical second mining, or call it pillar mining, in full retreat. It is quite in order to be governed by that principle for the exhaustion of virgin areas. The same principle can be followed in working out many mined-over areas to advantage even though there has been a lapse of many years between the time of advance and that of retreat. There are reasons to believe that progress can be made in drawing pillars by *continuous mechanical means* at a saving which will make the effort worthwhile.

Reducing Delays Between Face Operations

It is good business to make improvements at points where there is possibility of the largest gain. One of these points is at the face of a coal mine. It is not too much to expect that ways and means can be devised and perfected to win coal from the face continuously without interruption and in the manner for complete recovery. Some companies are making definite strides in that direction. The face is the most difficult point at which to make the attack, but there lies the chance of making the greatest saving.

There may be some advantage, when thinking along these lines, in naming the different operations which go on at the face where mechanical loading is done, that is to say, timbering, cutting, drilling, charging, shooting, loading and gathering. Each operation is carried out as a separate job which sets up and encourages a period of lost time between each of the acts. Many machines, in other lines of endeavor, simultaneously perform several operations with continuity and without interruption. Much ingenious equipment already serves the industry, remarkable in its performance and particularly efficient in underground use. May it not be expected that much of this equipment can be modified, rearranged and applied to provide a continuous flow of coal from the face loading to as far away as a train of mine cars on an underground siding?

It is granted that all coal mines are not alike. The fact is that each one is different in many ways, from the others, but there are three fundamentals which apply to all coal mines: a top, a seam and a bottom, some of which or all of which may be classified as good, medium or bad. The system and the mechanics for continuous productivity had best be worked out in the anticipation of bad, or difficult, conditions of top, seam and bottom. The application to easier conditions will then take care of itself.

The lack of integration of the mining unit at a mechanical loading face is cause for confusion and delay and machinery is needed which will automatically keep each job in proper sequence and establish and maintain a tempo of flow. No machine will serve which is not planned and designed to meet the physical mining conditions and possess features for loading coal throughout the work day. The capacity will be rated on a daily basis rather than on a high hourly basis, which means steady loading throughout the day. At present there is a lot of nonproductive time in a coal-loading cycle and the work has to be carried on with too much haste. This habit increases the possibility of hazard and is more exhausting to the worker than it should be.

Requirements for Continuous Face Operation

A working place can be considered to better advantage as holding a day's production from one unit or thereabouts and the idea is to turn the time lost in moving from one place to another into productive time. The equipment employed will have to accept close timbering at all times without interference. The basic principles of good mining should not be violated by driving to an excessive width of place, as wide widths cause the loss of roof support on both advance and retreat and is by all means to be avoided. The equipment must operate at capacity in a narrow width, or at least a width suitable to the top, and the full advantage of natural support retained. It will have to operate in a reasonable height of seam with equal productive efficiency on advance and retreat mining.

Other factors which enter the picture such as ventilation, drainage, dust control, gas and all safety measures can be handled most effectively and profitably with a minimum expenditure of time and effort by following these general principles of mechanization.

Concentration at one face, with high daily capacity, will permit spending more for better and sufficient supervision and will warrant provision for on-the-job engineering talent. The machinery put into use in the place will have to eliminate any necessity for hard, physical labor in connection with loading coal through its ability to advance or retreat and mine in continuous operation.

Any system of mining and the equipment will have to be worked out to fit into mines now in operation. It can be expected that prior art and manufacture will have to be copied and used in order to meet the problem. The industry cannot afford radical departure in method or mechanization, nor will that be necessary, since much that has gone before can be applied. The capital cost for the equipment will likely run at the same cost per ton of annual production as that now in service. There is sufficient skilled labor at the mines to operate the machines, but likely there may be a shortage of mine help accustomed to pillar work in many localities where coal mining is done.

The coal industry and the manufacturers supplying machinery to the mines are necessarily inseparable and have always worked closely together. Progressive mechanical performance cannot be had without their continued cooperation and support. Capable management, both at the mines and at headquarters, acknowledges the need for larger productive results at the face, and is willing to provide capital requirements which will bring about a condition of that kind.

This article is an attempt to stimulate and encourage thinking along the lines of improvement in continuous mechanical mining at the face, where the task is most difficult of attainment but where I believe the greatest gain can be had. I have spent much time in the study of this problem and believe a system of continuous, automatic mining from the face to the loading point at the underground siding is entirely possible. Furthermore, I believe it to be necessary if mining under the present high cost of production is to continue profitable to the operator.

WHEELS OF GOVERNMENT

As Viewed by A. W. DICKINSON of the American Mining Congress

POISED on the eve of the election which will decide control of the House and Senate for the two-year life of the 80th Congress, attention is focused on the home states and districts. Particularly in the case of the senatorial contests in West Virginia, Kentucky and the states of the Far West is the attention of the leaders of both political parties directed to the campaign which will decide the leadership of the Senate.

Meanwhile, the administration has continued to move further along toward the ultimate decontrol of the wartime price and wage structure and a number of its economic advisers are reported to feel that the National Labor Relations Act should be modified, proper safeguards provided against labor monopolies, and the Federal Government kept out of the field of wage determinations in industry.

Treasury Secretary Snyder has stated that no general tax reduction will be requested by the administration in the 80th Congress until more is known about tax receipts in 1947. However, the Treasury's general counsel, Joseph J. O'Connell, in an address on the West Coast, set forth that consideration is being given to increases in exemptions; reduction in rates on the lowest and highest incomes; special provisions to benefit small business; a permanent system permitting both individuals and corporations to average their losses on income over a period of years, and the general problem of income taxes on corporations. O'Connell frankly anticipated reduction of low-income-group taxes to maintain consumer purchasing power. He forecast the lowering of taxes in the high-income levels to encourage venture capital.

Price Decontrols

OPA has accelerated its removal of commodities from price control and it is reported that OWMR Director Steelman is inclining to the decontrol of additional items even to include copper, lead and zinc shortly after the election.

Leaders in these latter industries are calling for termination of price controls and the end of the wartime premium price plan, with adequate time allowed for the orderly closing of low-grade mines unable to compete. They also ask the restoration of adequate tariff protection and suggest Government aid to marginal producers to bring out metal required for national defense under the Stockpiling Act.

Lead Producers Meet

Finally meeting October 31, the Lead Producers' Advisory Committee is reported to have discussed decontrol and price relief with OPA officials. The meeting was executive in nature for organizational purposes and further meetings will be subject to call by the OPA.

Personnel of the committee: Kenneth C. Brownell, vice president, American Smelting & Refining Co.; F. F. Colcord, vice president, U. S. Smelting, Refining and Mining Co.; Irwin H. Cornell, vice president, St. Joseph Lead Co.; Henry L. Day, president, Monitor Mining Co.; J. B. Haffner, general manager, Bunker Hill & Sullivan Mining & Concentrating Co.; Norman Hickman, vice president, The American Metals Co., Ltd.; and E. H. Snyder, general manager, Combined Metals Reduction Co.

Zinc Price Rise

As of October 14, OPA increased the ceiling price on prime western zinc by 1 cent a pound to 9.25 cents, East St. Louis station. Similar increases were made for other grades of primary and secondary zinc, with scrap zinc upped ¾ cent per pound, rolled zinc products 1 cent per pound, and oxides ¾ cent to 1 cent per pound.

Beginning November 1, zinc is being released from Office of Metals Reserve (RFC) stockpile where urgently needed by manufacturers. Such consumers make application to the Tin-Lead-Zinc Branch of CPA. Current Government stocks of zinc on November 1 were reported as 209,000 tons, including special high grade, high grade, intermediate, brass special, select and prime western.

Krug-Lewis Controversy

A strained situation was precipitated October 21 when UMWA John Lewis accused the Government of breaching the Krug-Lewis coal mine contract. He charged a contract violation in the Government's determination of vacation pay for miners no longer on the payroll and in the tonnage basis adopted for payments to the miners' 5-cents-a-ton welfare fund. Lewis called upon Interior Secretary Krug to reopen the contract and start new negotiations by November 1, advising that failure "on your part to honor this meeting will constitute another breach of contract and void the Krug-Lewis agreement." The implied threat was a strike on the eve of the national election.

Washington Highlights

DECONTROLS: Speeded up.

TAXES: Action awaits 1947 Revenue estimates.

LEAD: Heavy pressure for decontrol.

ZINC: Granted price increase.

COAL: Wage demands jeopardize industry's future.

WAGES: Stabilization to go with price control.

TRAVEL-PAY: New Mexico potash suits would involve large sums.

SUPERVISORS: NLRB member takes constructive stand.

FREIGHT RATES: Railroads plead with I.C.C.

ATOMIC ENERGY: Control Commission appointed.

Secretary Krug was in the West, scheduled to return to Washington November 6. He telegraphed Lewis requesting that UMWA representatives meet Coal Mines Administrator Collisson on November 1. Lewis responded by accepting and stated that "under these conditions the Krug-Lewis agreement remains effective and unchanged during ensuing period of negotiations."

Thus while the immediate threat of a strike was avoided, the negotiations now under way are interpreted by many as setting the stage for a further increase in wages and hence costs. Such increases will not only seriously jeopardize the position of the coal industry in its competition with other sources of power but will be the spearhead for general wage demands in all industry. The inevitable consequence would be an increase in commodity prices to the point where consumers will retrench on purchases, bringing on a more serious deflation shock than if the upward spiral were curbed right here and now.

Wage Controls

Apparently the administration intends to let wage controls succumb as price controls are lifted. The President has said, "We all recognize the close relationship between wages and prices. If either one rises too high, the other is certain to be affected. Price control and wage control are largely dependent upon each other. As we speed up the removal of price controls, the removal of wage controls will also be accelerated. In this way, we shall move steadily — as quickly as we safely can—toward a free economy and a free collective bargaining."

Both industry and labor spokesmen have called for an end to wage control. An OWMR special committee headed by Dr. George W. Taylor, after attempting to evolve a new wage stabilization policy, reported inability to agree. An administration official has stated, however, that wage controls cannot be lifted at present because such an act would bring on more wage demands than either industry or the Government could cope with.

Back Pay Litigation

Travel time controversies under the Fair Labor Standards Act have prompted three suits against potash companies in New Mexico, which, if successfully prosecuted, would cost the producers millions of dollars. Involved is travel time from a residential town located approximately 30 miles from the mines and also pay for time the employe spends at the property before entering the mine. The men are not required to use any special means of transportation en route to the mine but are entirely free to proceed to their work in the way that best suits them.

The Gwynne bill, discussed in previous issues, would have limited suits for back pay, overtime and "liquidated damages" to three years. The bill also contains a paragraph which reads: "No liability under Subsection (b) (relating to penalties) shall be predicated in any case on any act done or omitted in good faith in accord with any regulation, order, or administrative interpretation or practice, notwithstanding that such regulation, order, interpretation, or practice may, after such act or omission, be amended, rescinded, or be determined by judicial authority to be invalid or of no legal effect." Thus retroactive protection would be given to the extent indicated. Even if passed early in the 80th Congress, the Gwynne bill, in its present form, would not afford protection to employers from this heavy liability. The bill might, however, be amended to accomplish this objective.

Supervisory Employes

While the Jones & Laughlin Steel Company case on the supervisory employe issue is pending in the Supreme Court, a new note on this question has been sounded by the member of the National Labor Relations Board who succeeded Gerard D. Reilly on August 26. James J. Reynolds, the recent appointee, has twice dissented against granting rank-and-file unions bargaining rights for supervisory employes. Reynolds stated, "The certification would result in the establishment of an insoluble incongruity since it serves to place the monitorial employe, entrusted with the duty of reporting the misconduct of fellow union members, in the anomalous position of having to serve conflicting loyalties. . . . It is the affirmative duty of this Board to avoid encouraging creation of relationships which are inherently unsound industrial relations practices."

Freight Rates

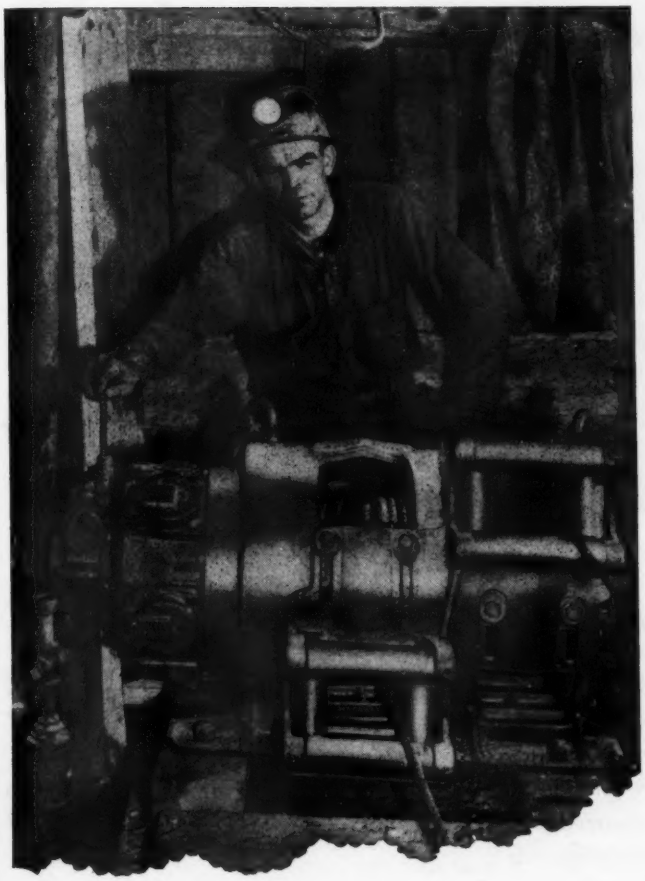
The railroads have filed a further brief in support of their position for an increase of 25 per cent in freight rates. The position taken by representatives of the mining industry on this issue was discussed in the October Journal. The railroad brief urges that the ICC be generous in its decision, stating that the carriers' net income has been heavily reduced by labor costs, payroll taxes, and vacation costs. It is also set forth that prices of railroad materials and supplies, including food, have increased greatly and that the rate increases sought would amount to less than half of the increases in operating expenses suffered since 1939.

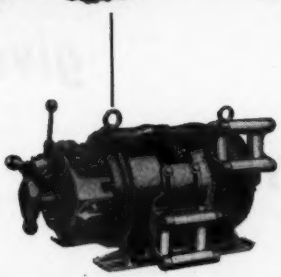
Atomic Energy Commission

Under authority carried in the "Atomic Energy Control Act" the President has appointed the Atomic Energy Commission. Appointees are David E. Lilienthal, chairman; Dr. Robert F. Bacher, William F. Waymak, Sumner Pike, and Rear Admiral L. L. Strauss. Lilienthal and Bacher are experienced in the field of nuclear fission. Waymak is the editor of the Des Moines *Register and Tribune* as well as a director of the Chicago Federal Reserve Bank. Pike is a former insurance executive and member of the Securities and Exchange Commission. As a member of the Army-Navy Munitions Board, Admiral Strauss has a broad field of experience in the occurrence and purchase of metals and minerals. He is also a member of the New York banking firm of Kuhn, Loeb & Co.

The functions and properties of the Army's "Manhattan District" are being taken over by the commission, with the Army, of course, carrying on its duties until the transfer is completed.

"No Old-Fashioned Slusher for me —this is a Gardner-Denver *single lever* Airslusher!"





Gardner-Denver Airslusher

Gone are the days when the operator had to pull and tug at two levers to operate an old-fashioned slusher. Today, the Gardner-Denver Airslusher, with its single throttle lever control, can easily be operated with two fingers! What's more, the new advanced design of the Airslusher incorporates one-third the number of gears—one-third the number of bearings—one-third the number of oil seals—one-third the number of lubrication points—for greater simplicity and trouble-free performance.

Here are other reasons why you'll find the Gardner-Denver Airslusher a better buy for long, hard service:

Five-cylinder air motors—*high torque radial type—a lugger in low speed—vibrationless at any speed.*

No clutch wear—*roller clutch automatically and instantaneously engages one drum and releases the other as throttle is reversed. No clutch facings to wear—nothing to adjust or lubricate.*

Completely sealed—*water or dirt can't get into the Airslusher! Lubricant is sealed in—water and dirt are sealed out.*

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Frank W. Bowdish has been appointed assistant metallurgist in the Research Department of the Oliver Iron Mining Company. He was formerly research engineer of the Massachusetts Institute of Technology and prior to that had been employed at mining operations in Canada. **David Hill** has been transferred from the Duluth general offices of the company to the Mesabi Iron Range, where he has taken up his duties as exploration engineer, with headquarters at Coleraine, Minn.

Bituminous Coal Research, Inc., of Pittsburgh, has announced that **James R. Garvey**, former captain in the U. S. Army Air Corps, has been added to its development engineering staff to expedite production and home testing of BCR smokeless stoves.

J. E. Berg, formerly general mine superintendent, has been named assistant general manager of the Federal Mining & Smelting Co., Wallace, Idaho.

W. H. Straley, 3rd, has been named assistant professor of geology at the Georgia School of Geology in Atlanta. Professor Straley was former professor of geology at North Carolina State University and Baylor University in Texas. During the war he served on the Board of Economic Welfare in Washington.

Geo. R. Higinbotham, vice president of operations of the Consolidation Coal Co., was elected president of the Central West Virginia Coal Mining Institute at its final meeting of the year, held November 8, 1946, at the Waldo Hotel, Clarksburg.

Other officers elected were **Arthur E. Belton**, secretary, and **P. J. McGraw** (reelected) treasurer of the institute. All of the officers were elected by acclamation.

Vice presidents appointed at the meeting were **C. I. Bennett, Alfred R. Reppert, J. H. Nusum, C. H. Higinbotham, M. J. Andrews, B. H. Cutright, John Hogue, Otto Hyer, William Christia, Ora Cunningham, Don Potter, Cecil E. Jenkins, F. K. Day, E. P. Brennen, C. M. Hoard, K. W. Bartlett and E. F. Miller.**

J. G. Huseby has been named assistant manager of Mountain Copper Company, Ltd. Mr. Huseby has been superintendent of operations at Shasta County, Calif., and will make his headquarters with the firm at their San Francisco office. **W. C. McClung** has succeeded Huseby as general superintendent of the Shasta County operations.

L. H. Hart, formerly geologist in charge of western exploration for the U. S. Smelting, Refining and Mining Co., has resigned to become exploration engineer with American Smelting and Refining Company. Mr. Hart's new work will include foreign examinations under the direction of the company's New York office, but he will make his permanent residence in Salt Lake City.

H. E. Stocking has resigned as geologist from the New Mexico Bureau of Mines to accept a position as associate professor of geology at Oklahoma A. & M. College.

Dr. C. Richard Walmer has been appointed medical director of Industrial Hygiene Foundation at Mellon Institute. As a full-time physician for Industrial Hygiene Foundation, Dr. Walmer will direct the medical phases of the Foundation's work for the improvement of working conditions and the advancement of employe health in industry. He will also serve as secretary of the Foundation's Medical Committee, which is headed by **Dr. A. J. Lanza**, associate medical director, Metropolitan Life Insurance Co. of New York.

Announcement of the appointment of **E. D. Wingfield** as general manager of the Freeport Sulphur Co. has been made by Langbourne M. Williams, Jr., president. Mr. Wingfield has held operating, sales and executive positions with the organization since 1933. He will continue to have offices in New Orleans, headquarters for the company's mines in Texas and Louisiana.

E. S. Tillinghast, A. J. Myers and **W. J. Bennallack** have retired from their positions as superintendent, chief engineer, and chief clerk, respectively, at operations of the Inter-State Iron Company.

Ralph O. Brandon, Hibbing, Minn., superintendent of the Longyear Mine, has been transferred to the Hill-Annex mines as superintendent, succeeding **E. S. Tillinghast. John Linden**, assistant superintendent of the Hill-Annex, has been transferred to the superintendency of the Longyear Mine. **Albert Sidel** has been promoted to general foreman of the Hill-Annex Mine from general pit foreman. **Adolph Seaberg** has been advanced from pit foreman of the Hill-Annex to general pit foreman of the same mine. **A. J. Myers**, chief engineer of the Hill-Annex operations, has been succeeded by **H. J. LaPage.**

At the Virginia general offices of the Inter-State Iron Co., **Howard Caddy** has been appointed assistant chief engineer, under **A. N. Wold**, chief engineer. **Sumner Tonnessen**, assistant chief clerk, has been appointed chief clerk to succeed **Mr. Bennallack.**

— *Obituaries* —

William A. Maxwell, 67, of Denver, former president of the Colorado Fuel & Iron Corporation, died in Pueblo, Colo., as a result of a hunting accident on October 30. Mr. Maxwell was a veteran steel man and well known throughout the western states.

Henry James Irving, manager of sales, National Lead Co., recently died at his home in Montclair, N. J. He was born in Dravosburg, Pa., December 19, 1890, and started work with the Pittsburgh branch of the company on March 1, 1914. He was elected treasurer of the branch in June, 1923, and was advanced to vice president in 1932. On his transfer to New York City in January, 1942, Mr. Irving was appointed manager of metal sales. He was made metal sales committee chairman in March, 1942.

Frederick Albert Hills, 60, construction superintendent for the Anaconda Copper Mining Co., died suddenly in Butte in October. He supervised the construction of the chrome developments at Benbow and Mouat, near Columbus, Stillwater County, Mont., and the basic magnesium plant near Las Vegas, Nev.

Peter S. Haury died in Tucson on October 11. Mr. Haury was mining engineer attached to the Tucson Division of the United States Bureau of Mines at the University of Arizona.

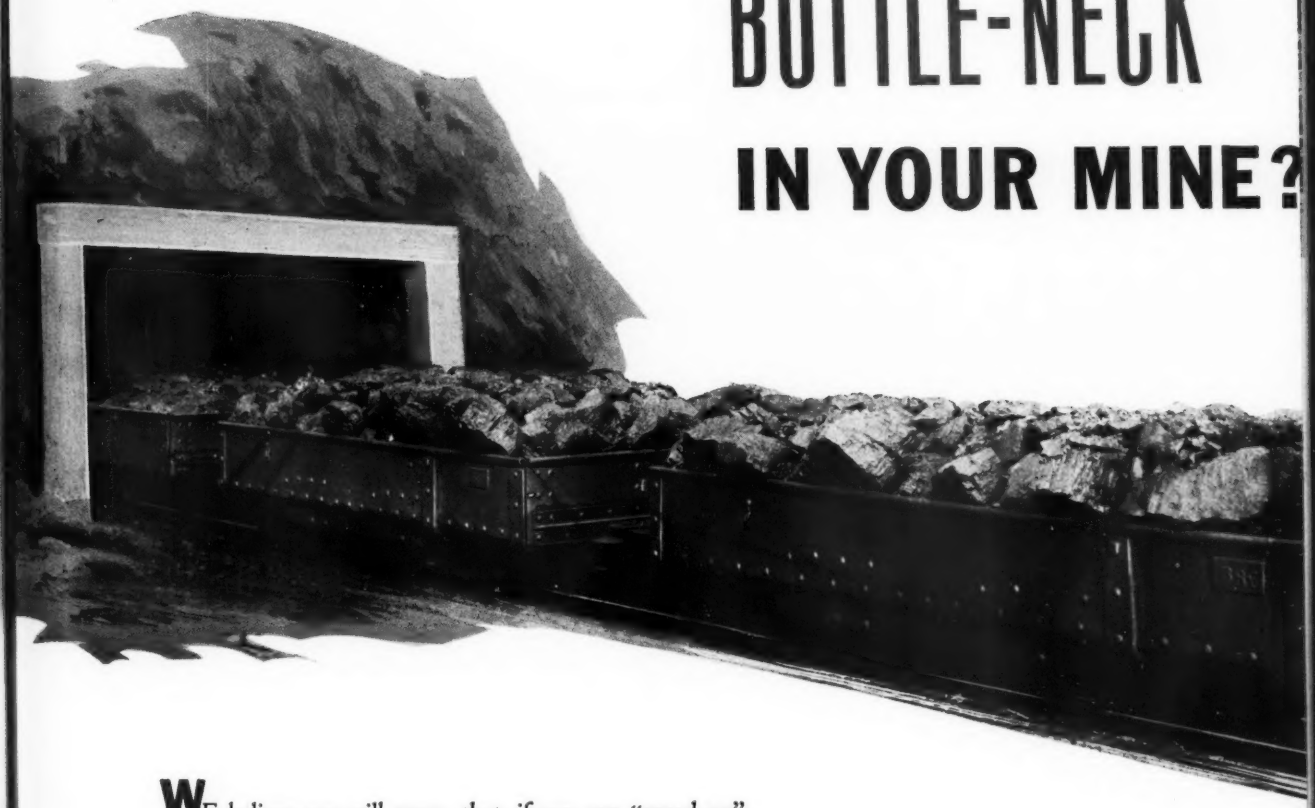
Frederic Juenger, of New York, City, and for 27 years traffic manager of the Texas Gulf Sulphur Co., died on October 21 at Union Hospital, in New York.

Born in Houston, Tex., on September 30, 1883, Mr. Juenger obtained his first employment with the railroads in that city. He subsequently moved to New York City and served during World War I as traffic manager of the Southern Cotton Oil Co. In 1919 he became traffic manager of the Texas Gulf Sulphur Co.

James E. Jopling, retired, nationally known mining engineer, died at his home in Marquette, Mich., late in September, at the age of 83. The greater part of his professional years were with the Cleveland-Cliffs Iron Co. and he retired as chief engineer of the company in 1927. The late Mr. Jopling was one of the best-informed men on Lake Superior mining engineering and he handled many important mining transactions.

Hugh C. Boyle, 79, former superintendent for many years of the W. A. Clark Wire Co. at Elizabeth City, N. J., now the Phelps Dodge Copper Products Corp., died late in October after a long illness.

IS TRANSPORTATION THE BOTTLE-NECK IN YOUR MINE?



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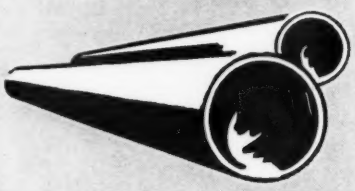

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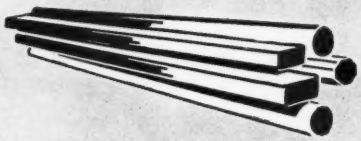

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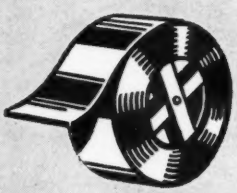
Water-hardening, Oil-hardening and High Speed Grades.



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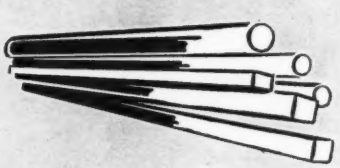

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157-8

NEWS and VIEWS

International Diesel crawler tractors play an important part in the moving of gravel and crushed stone at the Bryan Rock & Sand Company's operations at Raleigh, N. C.

Eastern States

Institute Announces Important New Research Program

Anthracite Institute has just completed arrangements for a four-company research project at Wilkes-Barre which is expected to provide unprecedented facilities and personnel for experimentation with various phases of the gasification, oxygenation and pelletizing of the small sizes of anthracite and anthracite fines.

The Wellman Engineering Co. of New York is supplying a small gas producer of a type similar to the several hundred commercial installations that are now being used for gasifying the buckwheat and rice sizes of anthracite.

Air Products, Inc., of Emmanus, manufacturers of individual oxygen generators designed for industrial plants, will furnish a suitably sized unit to supply oxygen instead of air for experimentation and comparative tests.

J. F. Pritchard & Co., of Kansas City, has supplied a commercial sized machine suitable for pelletizing anthracite fines for use both in the gas producer and for such other combustion tests as may be deemed expedient.

Anthracite Institute will supervise and execute the general research program resulting from the grouping of these devices. In this they will be assisted not only by the above companies but also by such other companies and institutions as may later be included.

As the equipment is of a type that could not be conveniently housed in Anthracite Institute Laboratory, the Glen Alden Coal Co. will furnish space for its erection. However, the tests will be conducted from all types of anthracite from the several regions.

Plans are also being made to include pulverization and traveling grate stokers in the scope of this research project.

This will be the first opportunity which research engineers have had for extended tests upon a single grouping of these importantly interrelated devices. Individually or in combination, the methods to be investigated will undoubtedly lead to improvements in utilization of anthracite fines, and to an upgrading of the small sizes of anthracite.

Coal Sessions Highlight Technical Advances

The ninth joint meeting of the Coal Division of American Institute of Mining and Metallurgical Engineers of the Fuels Division of the American Society of Mechanical Engineers was held at Philadelphia, October 24-25. The program embraced discussions of fine-coal cleaning in the Netherlands, preliminary test of Dutch Cyclone Coal Washer, combustion of anthracite, mine haulage problem, atomic energy, and a panel discussion on "Why So Many Sizes of Coal?"

At the meeting Dr. Arno Fieldner, of the U. S. Bureau of Mines, Washington, D. C., was presented with the Percy Nicholls Award.

Pittsburgh Geological Society Elects Officers

At a recent meeting of the Pittsburgh Geological Society, Mr. Hugh R. Brankstone, geologist, Gulf Oil Corp., was elected president for the year 1946-47. Other officers include Dr. Shailer S. Philbrick, vice president; W. B. Robinson, secretary; and C. H. Feldmiller, treasurer. Councillors for the year will be George C. Grow, Jr., past president, Raymond E. Birch, Daniel A. Busch, Richard M. Foose, John T. Gale, J. LeRoy Kay, and James H. C. Martens.

For the coming year the new program committee, headed by Dr. D. A. Busch, is planning a very interesting roster of broad geological scope, which will probably include a full day's symposium on the Ordovician.

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Gauger Talks to Coal Institute

Approximately 50 coal operators, mine inspectors, supervisory personnel and their guests attended the regular meeting of the Central West Virginia Coal Mining Institute held in Fairmont, W. Va.

G. R. Higinbotham, vice president, presided over the meeting and introduced the principal speaker, Dr. A. W. Gauger, director of Mineral Industries Experiment Station, of Pennsylvania State College.

Dr. Gauger's most interesting topic was "What Price Carbon," and he illustrated his lecture by use of slides.

Among some of the sub-topics covered by Dr. Gauger were the cost of internal versus external heat for man, the value of carbon in its various forms, the different materials made from coal, and the cost of synthetic gasolines and their yields by the various coals and processes. He also informed the group that we have only a 37-year supply of natural gas left in the United States, based on present known reserve and consumption.

Another meeting of the Institute was held in Clarksburg on November 8, 1946, and the program was sponsored by the Goodyear Rubber Co.—presenting "The Way Over the Mountains," in charge of Mr. E. W. Stephens, Jr.

Kanawha Coal Operators Association Elects Garner Williams President

Holding its forty-second annual meeting on October 17 at Charleston, the Kanawha Coal Operators Association elected Garner Williams, vice president, Truax-Traer Coal Co., president for the coming year. The meeting was one of the best attended in recent years. The business session was presided over by outgoing President Frank L. Hornickel. Following committee reports, E. R. Burke, president of the Southern Coal Producers Association, explained actions taken by his organization during the past several months with respect to overall wage matters. C. C. Dickinson made a report covering the activities of the Property Owners Committee. Activities of the West Virginia Coal Association were outlined by J. B. Sullivan. Executive Secretary Harry G. Kennedy reported on the work of the Kanawha Association during the past year.

New officers elected for the ensuing year, in addition to Garner Williams, were: D. W. Martin, president of Wyatt Coal Co., as vice president; A. W. Pollock, vice president of Spruce River Coal Co., as director emeritus; D. C. Kennedy, as secretary emeritus; Harry G. Kennedy, as executive secretary; and John L. Dickinson, as treasurer.

BARTON SAFETY CLUB HOLDS ANNUAL AFFAIR

Club Doing Fine Job in Aiding in Accident Prevention

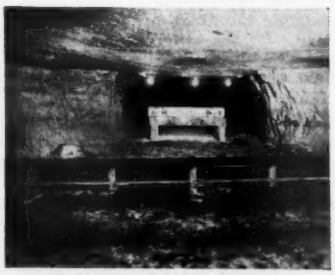
The Barton Safety Club, consisting of members who are employes of Pardee & Curtin Lumber Co.'s Bergoo No. 2 mine, recently held their annual "get-together" at Webster Springs, W. Va.

Seventy-four guests attended the annual dinner, which started off the event, and were shown U. S. Bureau of Mines' sound-motion picture entitled "Safety Training for Coal Miners." A verbal description was given by Mr. E. E. Quennin, engineer, U. S. Bureau of Mines, Pittsburgh, Pa. Brief talks, in addition to the pictures, were presented by Messrs. G. R. Spindler, chief, West Virginia Department of Mines; W. Dan Walker, Jr., senior engineer, Fairmont, W. Va., office U. S. Bureau of Mines; C. I. Bennett, inspector at large, West Virginia Department of Mines; and from representatives of various mining equipment manufacturing companies, including Jeffrey Manufacturing Co., Columbus, Ohio; Cardox Corp., Chicago, Ill.; and Joy Manufacturing Co., Franklin, Pa.

One of the special features of the evening was a talk on world affairs by "Mac" McGinnis, representative of the Explosives Division of du Pont Co. Mr. McGinnis, alias Dr. O. K. Spectorsky, foreign mining engineer, offered very pointed reasons why certain foreign countries' economic and social systems were so far ahead of the American system. Members present, who were unaware of McGinnis' disguise, were highly insulted, and special efforts were maintained to guarantee his safe exit from the banquet hall.

Barton Safety Club was formed by officials and members of Pardee & Curtin Lumber Co.'s Bergoo No. 2 mine. The sole purpose of the formation of the club was to prevent accidents in and around No. 2 mine, and to introduce the thought of safety into the home.

Miss Justine Smith, Miss Helen Payne and Miss Helen Cump acted as usherettes and presented prizes to the contest winners



Underground first aid station

Underground rectifier station—all wires are imbedded in walls and floors

General safety meetings are held three to four times a year at the Curtin Community Building. These meetings are usually headed with the presentation of motion pictures and talks by prominent members of safety organizations. The above meetings are held to promote safety in the home as well as in the mines. Weekly meetings are, however, held each Monday morning, underground at the face of operating sections. These meetings are on company time and usually last from 15 to 20 minutes. Records of the meetings are made by each section foreman in charge of his respective group. Such records are turned over to the general mine foreman, and a safety council is formed to put any ideas that might have developed at the meeting into actual practice.

The Safety Club climaxed its annual get-together with an "ox-roast" on the grounds at the Curtin ball diamond. Prizes, in addition to the free serving of food, were given to winners of various contests. Contests included timber - setting, softball games, greasy-pole climbing, fat and

slim women's races, and games of horseshoe pitching.

Clarence Beale, head of Local No. 6502, United Mine Workers of America, is president of the club, and A. P. Hamrick is secretary. E. G. Shipman, safety inspector for Pardee & Curtin Lumber Co., is treasurer, and Ralph Beckwith, assistant superintendent, Bergoo Mine No. 2, is a member of the board of directors.

New River Association Holds Successful Meeting

With over 100 coal mining men attending, the New River Coal Operators Association held a highly successful meeting at Mount Hope on October 22.

At the business session Secretary Stanley C. Higgins reported upon the past year's activities and revealed that the Association represents practically all of the tonnage in the field. Other speakers were Jesse Sullivan, secretary of the West Virginia Coal Association, who discussed state legislation; Walter Thurmond, who talked on the labor relations of the industry as applied to the Association; Charles E. Mahan, vice president and general counsel of the New River Co., who presented a constructive discussion of the Fair Labor Standards Act.

For the coming year the following officers were elected: J. M. McCauley, manager of mines, the New River Co., president; L. C. Campbell, vice president, Koppers Coal Division, Eastern Gas & Fuel Associates, vice president; P. M. Snyder, vice president, Koppers Coal Division, Eastern Gas & Fuel Associates, treasurer; and S. C. Higgins, secretary.

Lack of Records Often Hinders New Operations

The Maryland Bureau of Mines has recently pointed out that one of the most neglected matters in most coal mining states is the keeping of reliable history on the origin and operations of the various mining companies. The bureau points out that a great deal of expense and trouble would be spared if such historical data and former underground and surface maps were available at the present time. Practically the only available underground data prior to 1900 are based on hearsay in this portion of Maryland and such information is generally faulty. Had maps of the underground workings been made, and copies thereof kept in some safe storage locality, a great deal of expense would have been avoided in present-day coal operations in Big Vein mines and much coal which was lost by previous coal operators could be recovered and marketed, with resulting benefit to miners, operators, and the public in general. Lacking such maps, the operator who plans to recover the remaining Big Vein pillars is risking his capital.

MARSHALL HANEY, Ph.D.
Consulting Mining Engineer
Examinations Reports
Appraisals
1103 Flower Avenue
Takoma Park, Md.

C. & O. Constructing Railroad Extension

A 14½-mile extension is being built by the Chesapeake & Ohio Railway to serve operations of the Clinchfield Coal Corp. Three of the four sections in the project are being built and a 3,400-ft. tunnel through Pine Mountain will soon be initiated. The tunnel will extend from Wise County, Va., to Letcher County, Ky. A railroad extension will run through Almira and Pound, Va., to a tipple of the coal company on Meade Fork.

Heavy Media Separation Plant Being Built

A heavy media separation plant is being built by the Sloss Sheffield Steel & Iron Co. at Russellville to handle ore from open-cut mines at that point. The new plant, first of its kind to be erected in the South, is expected to be ready by January and will cost about $200,000. Five 15-ton diesel trucks are to be placed in service to haul brown ore over specially constructed roads from the mines.

Calumet and Hecla to Build New Fabricating Plant

The Calumet & Hecla Consolidated Copper Corp. has recently announced that it will build a new fabricating plant at Decatur. The plant will make tubing and allied products of copper, copper-base alloys, and aluminum. The plant's output will augment production of its Wolverine Tube Division at Detroit, Mich.

Engineers Wanted

Experienced in estimating, layout and detailing of coal cleaning plants, coal tipples and material handling plants. Excellent pay and opportunities.

ROBERTS & SCHAEFER CO.
307 N. MICHIGAN AVENUE
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Telephone—Central 7292
E. C. Molke, Chief Engineer

Big Sandy Elkhorn Meeting

The Big Sandy Elkhorn Coal Operators Association held its annual meeting at Lexington recently. Reports outlining the work of the association during the past year were given by association officials. Following this, brief addresses were made by W. R. Thurmond, secretary, Southern Coal Producers Association, and J. W. Haley, of the National Coal Association.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912.

Of THE MINING CONGRESS JOURNAL, published monthly at Washington, D. C., for October 1, 1946.

City of Washington,
District of Columbia, ss:

Before me, a notary public in and for the state and county aforesaid, personally appeared Julian D. Conover, who, having been duly sworn according to law, deposes and says that he is the editorial director of THE MINING CONGRESS JOURNAL, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in Section 537, Postal Laws and Regulations printed on the reverse side of this form, to wit:

1. That the names and addresses of the publisher, editor and business manager are: Name of publisher, The American Mining Congress, Washington, D. C.
Editor, Julian W. Feiss, Washington, D. C.
Business manager, B. C. Wilkerson, Washington, D. C.

2. That the owners are: The American Mining Congress—a corporation, not for profit. No stockholders. President, Howard I. Young, St. Louis, Mo.; Secretary, Julian D. Conover, Washington, D. C.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

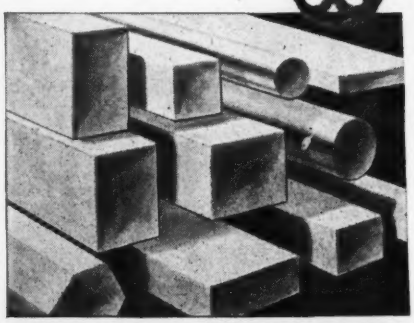
JULIAN D. CONOVER.
Editorial Director.

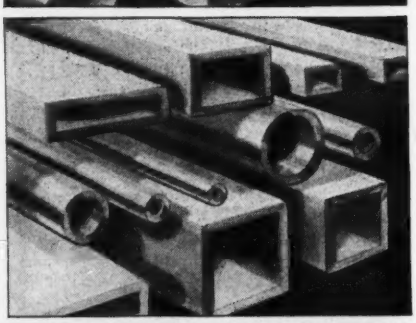
Sworn to and subscribed before me this 23rd day of September, 1946.

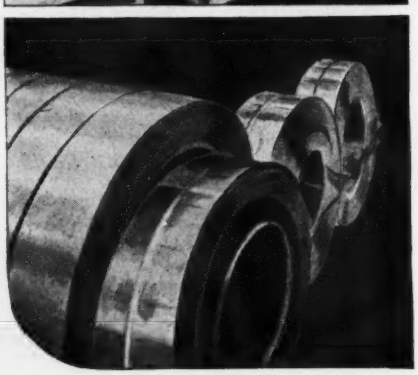
ELSIE L. LEISHEAR,
Notary Public.
(My commission expires December 31, 1948.)

NOW

Brass Mill Products Quickly!







A large supply of brass mill products is now offered to the trade at unusually low prices. The entire inventory may be fabricated by normal production methods and is being sold in production quantities.

The inventory includes: Free Turning Brass Rod—1 inch diameter and larger; Copper and Brass Tubing—3 inch O.D. and larger; Naval Brass Rod—various diameters; Aluminum Bronze, Manganese Bronze and Silicon Bronze in various shapes.

• • •

This material is offered in the following sequence as provided by law: (1) Certified Veterans of World War II; (2) Subsequent priority claimants; (3) Non-priority purchasers. Federal agencies have had opportunity to fulfill their needs. VETERANS OF WORLD WAR II should apply to their nearest WAA Regional Office for certification; the case number assigned and the location of the certifying office must be stated in a Veteran's offer to purchase.

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157-8A

Bauxite Concentrated Successfully

Recent laboratory and pilot plant investigations by the U. S. Bureau of Mines in the processing of representative bauxite samples from Saline and Pulaski Counties have demonstrated that commercially acceptable concentrates can be obtained from these low-grade materials, according to Bureau of Mines metallurgists. These studies were undertaken as a part of the Federal Research program aimed at increasing the utilization of off-grade Arkansas bauxite in domestic aluminum production.

A report covering the experiment conducted has been prepared by the Bureau of Mines and may be obtained by asking for Report of Investigations 3909, "Concentration of Bauxite for Milling in the 50-Ton Bureau of Mines Pilot Plant, Bauxite, Ark."

The Illinois Mining Institute's 54th Annual Meeting

The Illinois Mining Institute held its fifty-fourth annual meeting on Friday, November 15, 1946, at the Hotel Abraham Lincoln, Springfield, Ill. The following interesting papers were presented:

"Procedures of the Bureau of Mines Under the Coal Mine Safety Code," by M. J. Ankeny, mining engineer and coal mine inspector, U. S. Bureau of Mines, Mount Hope, W. Va.

"Thick Seams of Coal in Colorado and the Rocky Mountain Area—Some Facts and Some Fancies," by Thomas Allen, state inspector of coal mines, Denver, Colo.

"Belgian and German Coal Mining During the European Campaign," by Dr. Louis C. McCabe, chief, Coal Division, U. S. Bureau of Mines, Washington, D. C.

"Development of Electric Locomotives for Use in Coal Mines," by John S. Beltz, chief engineer, mining department, The Jeffrey Manufacturing Co., Columbus, Ohio.

"Improved Methods of Drilling High Wall Rock," by G. H. Kilpatrick, drilling and blasting superintendent, Fidelity mine, the United Electric Coal Companies, DuQuoin, Ill.

At the evening session special guest speaker was Kenneth McFarland, Topeka, Kans., who talked on "The U in Business."

University of Illinois Coal Research Conference

Representatives of coal, railroad, and steel companies attended the Illinois Coal Research Conference on October 23 and 24 at the University of Illinois in Urbana, under the auspices of the Illinois State Geological Survey, in cooperation with the Illinois Coal Operators Association and the Coal Producers Association of Illinois. Technical papers were presented setting forth the results of research in coal problems conducted by the State Geological Survey.

Research in metallurgical coke production was described by Frank Reed, of the State Geological Survey. He pointed out that Illinois coal is being used for metallurgical coke in five commercial plants. He reported that use of Illinois coals for foundry coke is being studied, as is the production of char from low- or high-rank coals.

R. J. Helfinstine outlined combustion studies on the use of Illinois coal in domestic stokers and reported that smaller sizes were at least as good and generally a little better than the larger sizes. Briquetting studies and a comprehensive review of coal resources inventories were also presented at the meeting.

Geology and Mineral Resources Described in State Booklet

The Illinois State Geological Survey has issued a booklet entitled "What About Our Minerals?" designed to acquaint the public throughout Illinois with the mineral resources of the state.

Published in question and answer form, the booklet is elementary in character, but presents, in an informative manner, basic data on the state's resources and their uses.

STRAIGHT TALK TO COAL PRODUCERS

Run of mine coal can be classified potentially into five major end uses. In most cases, all five are desirable for full, profitable output. Metallurgical, Domestic Stoker, Specialized Industrial, Railroad and Domestic fuels can be prepared economically by R & S equipment in surface preparation plants, permitting full mechanization underground. The Roberts and Schaefer Company designs and builds *modern* coal preparation plants, capable of the highest percentage of profit realization. It will pay you to consult R & S Engineers on your coal problems.

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Mineral Rights Purchased

The Alco Corp., an Illinois concern, has purchased mineral rights in a 40-acre tract in the eastern section of Hardin County. The purchase includes rights to fluorspar, zinc, lead, and all other minerals, except oil and gas.

Delta Collieries Corporation Formed

Ayrshire Collieries Corp. has purchased and is operating the Delta mine of the Delta Coal Mining Co. in Williamson County. Robert P. Koenig, president of the Ayrshire company, has announced that a new wholly owned subsidiary titled the Delta Collieries Corp. has been formed to work a strip-mine operation.

Eagle-Picher Buys Plants

The Eagle-Picher Co. has acquired the East Chicago, Ind., plants of the International Smelting & Refining Co. The newly acquired property includes an extensive group of buildings centering around the lead refinery operations, manufacture of zinc oxides, and the electrolytic process for making white lead.

J. M. Bowlby, president of the company, declared the acquisition to be one of the most important expansion steps taken by the company. He pointed out: "The plant gives us new processes for the manufacture of our line of lead and zinc products; in addition, it is in a strategic geographical location to help us give greater and faster service to the diverse industries represented by our customers."

Report on Lead-Zinc Area of Dubuque County Issued

The U. S. Geological Survey recently issued a preliminary report on the Center Grove - Pikes Peak lead-zinc area of Dubuque County. The area is slightly west of Dubuque in the extreme southwestern part of the Upper Mississippi Valley lead-zinc district. Most of the exploration and development in the area has been limited to the upper 130 ft. of Galena dolomite, known to contain local deposits of lead and zinc ore. Additional exploration in the lower 125 ft. of Galena, and in the uppermost beds of the Platteville limestone beneath, is warranted to determine whether sizeable ore bodies exist here in deeper beds as they do in other parts of the Upper Mississippi Valley district.

The results of the investigation have been published on a map showing the area extent of the rocks in which the lead and zinc occur, the regional structure, and the location of the mines and ore-bearing crevices. Accompanying the map is a brief text prepared by Survey Geologists Allen Heyl, Jr., Allen Agnew, C. H. Behre, Jr., and E. J. Lyons, in cooperation with H. G. Hershey, of the Iowa Geological Survey.

Champion Mine Reopening Under Study

The Champion mine of the Copper Range Co., closed since September, 1945, is being studied by the company to ascertain whether it can be economically reopened on a limited tonnage basis. Mine and mill tests are being made in all phases of operation reviewed prior to making a final decision.

Parmanco
MECHANICAL FEED
HORIZONTAL DRILL.

Heat-treated gears are used in this transmission and spur gear reductions, with an ample factor of safety for the operation of machine under all conditions. Link-Belt bearings of extra size are used throughout. Augers are connected to main drive shaft through a self-aligning chuck of ample size, in which is secured the drive shaft by two shear pins which provide sufficient safety to rest of machine. The machine is raised or lowered to a height of 36 inches by jacks on front of machine, and rear of machine is mounted on two pneumatic-tired wheels which also have a 36-inch range of adjustments. The machine permits the drilling of a controlled-angle hole, which makes possible a great saving in the use of explosives through the cantilever effect of this controlled-angle drilled hole.

TRACTION EQUIPPED

PARIS MANUFACTURING COMPANY
PARIS, ILLINOIS

Gratiot Operations Resumed

Resumption of underground operations at Calumet & Hecla's No. 2 Gratiot shaft is reported. Repairs are being made and actual mining is expected to be under way shortly. The company is drifting north from the thirtieth level, No. 4 Ahmeek, and will raise from this drift to the bottom of No. 2 Gratiot. Exploration will be made from this point.

Magnetic Surveys in North-Central Minnesota

More than 200 miles of reconnaissance magnetic surveys in North Central Minnesota were conducted by the Bureau of Mines during the summer of 1945 to determine the presence of hidden iron ore in the region, Dr. R. R. Sayers, Director of the Bureau, reports.

The survey indicated certain iron ore areas favorable for more detailed studies, and valuable data were assembled for use in future surveys, Dr. Sayers said. Field observations were carried out by E. J. Longyear Co., Minneapolis, Minn., under the planning and supervision of the Bureau's Minneapolis Division of the Mining Branch.

The survey of North Central Minnesota began near the western end of the Mesabi Iron Range and extended southward to the northern limits of the Cuyuna Iron Range. The report states that no attempt was made to investigate local "anomalies" in detail, and most of the readings were confined to highways and roads.

Instruments used included a Hotchkiss Superdip, a sensitive compass-like instrument with a dip needle, and a Schmidt-type magnetometer, an instrument that records magnetic effects in the earth's magnetic fields. A total of 218 miles was surveyed, and 32 "traverses" were made—technical name for the series of lines used in surveying a given area.

The survey detected the presence of some iron ore deposits immediately south of the town of Emily, along the northern part of the Cuyuna Range, north of Deer River, and in other places. For a better understanding of the area studied, a more detailed survey is being planned by the Bureau.

Reserve Mining Company Purchases Beaver Bay Lands

The Reserve Mining Co. has acquired land on the north shore of Lake Superior, in the vicinity of Beaver Bay, which it is considering using for a harbor and plant site in connection with contemplated operations in taconite on the East Mesabi Range. The company has also purchased considerable land at Babbitt for a town site and waste disposal.

Buehler Building Dedicated

The Buehler Building of the Missouri Geological Survey, Rolla, was recently dedicated by Governor Phil M. Donnelly of Missouri. The building is dedicated to Henry Andrew Buehler, state geologist from 1908 to 1944 and member of many mining and scientific associations.

Howard I. Young, president of the American Zinc, Lead & Smelting Co., acted as master of ceremonies at the dedication.

Following the introduction of leading state officials, addresses were presented as follows:

"The Relation of Industry to the State Geological Survey," by George C. Smith, president of the St. Louis Chamber of Commerce.

"Today's Requirements for a State Geological Survey," by Dr. Morris M. Leighton, chief of the State Geological Survey Division, Department of Registration and Education, State of Illinois, Urbana, Ill.

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Scraper Stockpiling Ore

DUE to their long reach, Sauerman Power Scrapers have an advantage over other types of material-handling equipment for many jobs.

With one of these machines you can haul material from the top of a hill or from a pond, river or deep pit to a loading hopper, or build a big stockpile and reclaim from the pile with the same machine.

Capacities range from 10 to 600 cu. yd. per hour. Each machine, large or small, offers the greatest possible economy of power and labor in the performance of its specified job.

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is being used in the most modern cleaning plants for dewatering the minus ¼" or ⅜" sizes or reclaiming the minus 10 mesh.

Whatever the feed size is, the product from the "C-M-I" contains less surface moisture than that obtained from any other type of mechanical dewatering and at a cost of only a few cents per ton.

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"Master Miners" Named

Because they worked more than 46 years each without even a scratch to mar their records, and are still working 15 eastern Ohio coal miners were recently named "Master Miners" by Newspaper Columnist W. H. "Hi Waters" McWilliams. A badge of merit was given each miner at a big miners' safety meeting held on the Belmont County fairgrounds.

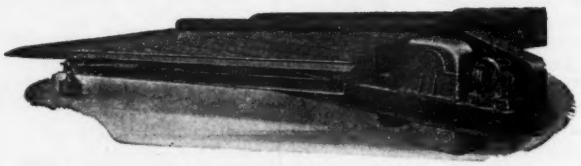
Paying the 15 Master Miners compliments for "outstanding contribution to safety" in letters to them were John L. Lewis, president of the United Mine Workers of America; Senator Robert A. Taft; Governor Frank J. Lausche; Secretary of Interior Julius A. Krug; Dr. R. R. Sayers, Director of the U. S. Bureau of Mines; and other notables.

"By the cooperation of the general public, the miners, the operators and the manufacturers, there is no reason why the coal industry should not become cleared of these accidents that so hamper progress and twist the hearts of its people. In my opinion, the selection of these outstanding men in the Ohio field will be an incentive to all other fields throughout the coal mine area of the United States to likewise commend their safety-conscious workers and thus advance the cause of safe work everywhere," Governor Lausche said.

The 15 Master Miners as selected by Columnist McWilliams are: John Sillmak, 73, Y. & O. Coal Co.; Rudy Vucelich, 60, Rail & River Coal Co.; Serrafine Bizzarri, 55, Monaco Coal Co.; Frank Kasprowski, 58, Hanna Coal Co.; Ralph Dematte, 53, Hanna Coal Co.; Albert Dorsey, 68, Lorain Coal & Dock Co.; John McNally, 64, Y. & O. Coal Co.; Dan Sakey, 63, Powhatan Coal Co.; Frank Makros, Sr., 71, Cambria Collieries Co.; Robert Hilton, 46, Warner Collieries Co.; William Schultz, 57, Warner Collieries Co.; John Kumberra, 61, Lorain Coal & Dock Co.; William Johnston, 56, Rail & River Coal Co.; George Chamberlain, 76, Hanna Coal Co.; Chris Johnson, 57, Powhatan Coal Co.

Part of the "safety team" which Columnist McWilliams selected were the 15 Master Manufacturers which had aided materially in increasing the safety of the mines and played an important part in the 750-year safety record of the Master Miners.

The manufacturers listed were: Westinghouse Electric, Pittsburgh; Goodman Mfg. Co., Chicago; Cardox Corp., Chicago; Jeffrey Mfg. Co., Columbus; Joy Mfg. Co., Pittsburgh; Tri-State Asphalt Co., Martins Ferry; Wood Preserving Corp., Marietta; Watt Car & Wheel Co., Barnesville; Link-Belt Co., Chicago; MacWhyte Wire Rope Co., Kenosha, Wis.; Mine Safety Appliances Co., Pittsburgh; Bethlehem Steel Co., Bethlehem, Pa.; Gunite Corp., Fairmont, W. Va., and Bellaire, Ohio; Tool Steel Gear & Pinion Co., Cincinnati; Du Pont, Wilmington, Del.



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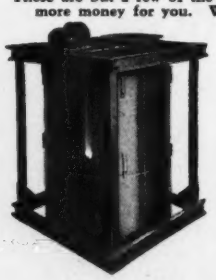
5. ECONOMICAL UPKEEP—Sturdy construction and mechanical simplicity keep maintenance costs down for added years of hard use.

These are but a few of the reasons why SuperDuty Coal Washing Tables earn more money for you. Write for further details.



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The Concenco Revolving Feed Distributor is a heavily fabricated, all-steel machine, built in various types, with motor drive requiring less than ¾ H.P. in operation. This distributor effects perfectly a splitting of feed sluiced to its revolving tank, into any desired number of equal portions. It is especially suitable for efficiently feeding a battery of coal washing tables, giving an equal distribution of feed to each table.

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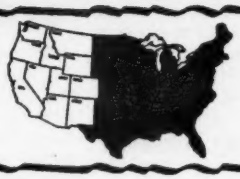
Evans Wallower Zinc Completes New Shaft

A new shaft at its No. 16 mine, located south of Picher, has been completed by Evans Wallower Zinc, Inc. The shaft is being opened up on a 165-ft. level. Near by, the Marcia K. Mining Co. has begun a new shaft to improve ventilation at the old Birthday mine.

Mary Ann Mine Sold

The Scott Mining Co. has purchased the Mary Ann mine, northeast of Picher. The lease was originally developed by the old Commerce Mining & Royalty Co.

Western States



American Zinc Speeds San Juan Expansion

The American Zinc, Lead & Smelting Co. has taken over operations of the Bachelor group of properties, thus speeding the San Juan expansion program in the Ouray district.

The Bachelor property is traversed by fissure veins in sandstone, limestone, and quartzite that have been traced for 5,000 ft. and show ore shoots up to 500 ft. in length. The ore carries lead and zinc with gold and silver, a typical assay showing 10 per cent lead, 8 per cent zinc, and 50 oz. silver per ton. The property is opened by the 5,000-ft. Syracuse tunnel to a depth of 1,300 ft., plus 800 ft. of work on the vein. Old workings 500 ft. above the present tunnel level are said to have produced $4 million. The Syracuse tunnel was driven to cut the junction of the Bachelor and Pony Express veins and to unwater the Bachelor shaft and upper workings. This work was completed some 20 years ago.

The mill is being entirely re-equipped with the most modern ore separating machinery and the capacity increased greatly for handling production from this mine and custom ores that come from the territory.

Gold, Silver and Lead Ore Body Opened Near Idaho Springs

Claude B. Garnett and associates of Denver, operating the M. & E. mine, 2 miles southwest of Idaho Springs, have opened a good body of gold, silver, and lead ore, which shows high-grade galena.

This ore is in virgin territory, 240 ft. from the portal of the main tunnel at a junction of the M. & E. vein and a crossfeeder vein.

The drift has been in solid ore for 20 ft. and the vein has widened to 8 ft. and continues to improve as it goes down. A winze is being sunk from the tunnel level and the ore saved for shipment. Assays taken run up to $40 a ton in gold, silver, and lead.

The property is equipped with gas engine, compressor, and the necessary drills, tools, and machinery. Six buildings have been constructed housing the machinery and providing quarters for the crew.

The mine is located on a good county-maintained road, which is kept open all year.

Rich Silver Vein Discovered Near Aspen

A rich 7-ft. silver vein was recently discovered at the old Mollie Gibson mine, near Aspen. Work in the mine is well along and the ore shows a high concentrate.

The Mollie Gibson, one of the most famous mines in the district, was discovered in the 1860's and has been a high producer ever since.

The main Mollie Gibson ore body consists of a peculiar rich ore which contains a large amount of polybasite and native silver inclosed in flesh-colored barite, locally called pink spar.

At various points throughout the mine there are local formations of ore which consist mostly of wire silver.

During its years of heavy production the mine had an average yield of 600 oz. of silver per ton. One 24-ton car of ore yielded $76,500.

Colorado Mining Association Meeting

The Colorado Mining Association will hold its annual three-day convention next February. The program is expected to give attention to problems of small mine operators, the Premium Price Plan, and to gold and silver questions.

A new feature of the meeting next year will include active participation by all mining counties and displays of mining activity in each county will be exhibited.

John Snyder, Secretary of the U. S. Treasury Department, will be guest speaker at the annual "Sowbelly Dinner."

Silver Standard Mining Company Expands Operation

Silver Standard Mining Company, in operations conducted at its No. 1 Mine near Santaquin, Utah, has entered a slightly mineralized area in a shaft now down some 490 feet. Geologists of the company had expected to cut this formation at the 500 level, indicating conformity in the district's mineral formations.

At the Lakes of Killarney claims in the Ophir, Utah, district, recently taken over by the firm, one of the old tunnels has been rehabilitated and placed into condition for mining operations. The company expects to ship a large tonnage of low-grade silver-lead ore from this property.

New Mexico Association Activities

John C. Pierce, new secretary of the New Mexico Miners and Prospectors Association, has completed a tour to the state's mining districts, where he has conferred with operators and secured first-hand information on the problems confronting the mining industry. Special study is being given these problems, one of which is the continued shortage of labor in the metal mines. Also being formulated is a legislative program at the 1947 session of the New Mexico legislature meeting next January.

Staff Positions Open

Foreign Service, Sea Level, Equitable Mild Climate

Mine Superintendent: experienced in top-slicing methods; salary $500.

Mine Efficiency Engineer: good background in mining, haulage, ore dressing, time studies, labor saving practices; salary $450.

Safety and Ventilation Engineer: experienced in mine safety and ventilation practices; salary $350.

Mill Operators: to teach and supervise native crews; experienced in selective sulphide flotation, crushing, grinding, filtering, etc.; salary $300.

Permanent with established enterprise; opportunities for advancement; three-year contract with three months vacation at end contract; free housing, light, heat; must report single status six months; traveling expenses paid for staff members. Applicants please state fully experience, education, age, physical condition, family status, references.

Address replies to Box "C" in care of this publication.

Program for Mineral Exploration Announced

The New Mexico Mining Branch of the U. S. Bureau of Mines at Silver City has launched a program of exploring domestic mineral deposits to extend through the 1946-47 fiscal year, Walter R. Storms, supervising engineer, has announced.

The program will be directed especially to a search for hidden ore bodies and the first two projects in New Mexico are in Grant County, where at the suggestion of the Bureau's Division of Geophysical Exploration diamond drilling has been started in the Copper Flat area of the Central Mining District, and in the West Pinos Altos District.

Gila Fluorspar Mill to Resume Operations

Shattuck Denn Mining Corp. will resume operations at its fluorspar mill near Silver City. The Reconstruction Finance Corporation has contracted with the company to treat present stock of crude ore for the Government.

Union Pacific Coal Operations

The Union Pacific Coal Company has prepared an interesting and attractive brochure designed to acquaint the public, and prospective employes in particular, with the operations of the company's mines located in Sweetwater and Carbon Counties.

Listed as outstanding achievements of the company are: (1) the supplying of fuel coal for the first transcontinental railway connecting the east to the west; (2) first coal mine development in Wyoming; (3) an unsurpassed mine safety record; (4) highest coal mine wage paid in the world; and (5) a record annual tonnage mined. The brochure, illustrated with striking pictures, describes the company's operations, working conditions, housing, hospitalization, employment conditions, and welfare and educational facilities located near the mines.

Silver King Makes First Copper Shipment

The Silver King Mining Co. recently made its first shipment of copper ore—25 tons—to the Garfield, Utah, Smelter. The mine from which the ore was taken was discovered four years ago and is located eight miles northeast above Laramie. Actual working of the mine got under way late in August. Two other mines have been located in the area and work is expected to start at an early date.

St. Lawrence Shaft Being Developed

Golden Messenger Corporation, after closing down its gold properties at York, Lewis & Clark County, in 1942, purchased the properties of the Crystal Mines at Basin, Jefferson County, and at Butte. The company has just unwatered the Old St. Lawrence shaft near Basin and is drilling a crosscut tunnel west from the Crystal claim to tap the St. Lawrence shaft at a depth of 400 ft. Several winzes have been sunk from the tunnel. The ore contains lead, zinc, copper, silver and gold. Substantial shipments have been made in the past. W. S. Norman, Spokane, is president and manager of the company; W. L. Bell, Spokane, is consulting engineer, and Charles R. Brazier, Helena, is secretary and Montana agent.

Silver Lode Adds Mining Claims

Silver Lode Gold Mining Co., a Washington corporation, has taken over 12 mining claims from the Marietta M. & M. Co., near Virginia City, Madison County. Ted Johnson, Manson, Wash., is president; John Hatch, vice president; Wellman A. Clark, attorney, and P. Evan Oscarson, consulting engineer, all of Spokane.

Ore Body Found at Bennett Mine

George Spehn has sold his entire interest in the Neihart Mining & Milling Co., at Neihart, Cascade County, to L. E. Taylor, who already owned a large interest in the company. Frank Stagg also purchased an interest in this company. Mr. Spehn has bought a large interest in the Bennett Mining Co., at Neihart, and is manager of that company. He reports that a body of lead-zinc-silver ore has been found at the Bennett mine after drifting 100 ft. through a fault.

Standard Cyaniding Resumes Gold Production

The Standard Cyaniding Company, one of the foremost gold producers in Nevada prior to the wartime closing order, has resumed operation in its open cut gold mine and cyanide mill. The property is in the Humboldt mountain range, five miles from Rye Patch, in Pershing County, and not far from Southern Pacific rail lines. The mill will treat about 500 tons of ore daily at present and build up to its 700-ton capacity.

Nevada Company to Develop Berlin Mines

The old Berlin mine in northern Nye County is to be developed at depth by a deep-level tunnel, accord-

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ing to reports from the Nevada Company, owner of the property.

Exploration of the Diana vein, source of the mine's principal production in years past, is to be the first objective of the tunnel. This vein was a rich producer at higher level, and the tunnel is expected to strike this vein at greater depth. The Berlin property embraces 16 patented claims, including water rights and a mill site.

Mining and Metallurgical Research Committee Formed

At a recent meeting of the State Advisory Mining Board held in Carson City, a mining and metallurgical research committee for Nevada was formed under the auspices of the Mackay School of Mines.

R. A. Hardy, Reno mining engineer, was named chairman of the committee; Henry M. Rives, secretary.

Also appointed was a program committee, named to further the plan and find ways and means of accomplishing its objectives. Program committee consists of Mr. Hardy, William Donovan of Silver City, J. H. Buehler of Pioche, J. P. Hart, Reno; George W. Mitchell, Eureka; W. S. Larsh of McGill, and Robert H. Raring, Battle Mountain.

Polaris Mining Company Operating Merger Mines

The Polaris Mining Company has taken over the operation of the Merger Mines group of mining claims on a 50-50 profit-sharing basis. This is one of several groups of mining claims owned or controlled by Polaris, including Silver Summit, Merger, Yakima-Shoshone and Chester, all of which are to be explored from the 3,000-ft. level in the Silver Summit shaft which is now nearing completion.

The company is operating a clamshell mucking device in sinking the Polaris shaft. It is the first attempt in the Coeur d'Alene district to use a mechanical mucker in shaft operations. The company claims a speed record in shaft sinking because of its use, announcing that the Polaris three-compartment shaft was put down 184 ft. in 31 days in July and 204.9 in 30 days in September.

New Principle in Gold Dredge Mining

The Crescent Pacific Mining Co., of San Francisco, is using a new principle in gold dredge mining on the Salmon River in Idaho, where the company has acquired a lease from the State of Idaho on the Salmon River, near the town of Lucile. It is called a suction dredge, and the operation is described by Walter Hovey Hill, a veteran mining engineer of Grangeville, Idaho, as follows:

"Operation is by remote control," he said, "and one man a shift can operate the plant. The company appears to be going at it in the right way to determine successful and economical methods for working of the Salmon's riffles.

"The equipment includes a pumper dredge using the Becker-Hopkins patent for the digging head and radius arm," he continued. "The boat is of the pontoon type, with all-steel construction with an over-all length of 52 ft. and width of 20 ft., plus the outriggers on each of the hulls as balancers, and which are 28 ft. long. The dredge boat has a draft of 20 in. and weighs 60 tons. The operation is diesel powered.

"The digging head, which is the point on a hollow shaft, is 8 in. in diameter and built of high-test steel and has in it 24 holes or openings just above the point, each 2 in. in diameter.

"As the point is lowered vertically into the bed of the stream it penetrates the gravel while revolving at a speed of 12 revolutions per minute, and as this point goes down all the fine gravel and material that will enter these openings is forced up like a core to where an 8-in. suction hose is attached to the tube or shaft, from where a pump sucks it up 20 ft. to a box containing a screen.

"All the gravel is washed in the pump and in the suction and discharge pipe. From the hopper the screen discards all the material that does not pass ⅝-in. slots onto a conveyor belt in the center of the boat, from where it is discharged off the tail of the conveyor at the rear end of the boat.

"The fines that drop through the ⅝-in. slot go into the distribution system of the 24⅜-in. sluice boxes on each side of the boat, which are lined with cocoa matting riffles and other standard form of gold-saving tables used on most gold dredges. The total sluice-box service is 24 by 32 ft.

"At the tail sluice, where the material goes overboard, is another slit screen that the fines drop through into an Allney bowl that catches some of the fine gold and is used as a clean-up pan."

Users of I-T-E protective equipment are pretty well represented by the mine owner who wrote: "It would be very difficult to convince our management that our mine could be satisfactorily operated without them".

Progressive management knows that the quality, service, proved performance, and inherent safety of I-T-E equipment pay in increased production and less time lost.

Contact the nearest I-T-E representative or write for Bulletin 2503.

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Lucky Friday Development Pushed

Completing more than 200 ft. of drift work recently, the Lucky Friday Silver Lead Co. has developed this vein on the 1,400-ft. level, where engineers report the 200 ft. as being all in high-grade milling ore. In October the east drift was reported to be in a full face of ore at least 7 ft. wide or possibly wider. A considerable stockpile is being created by Lucky Friday from this development with drifts both east and west being pushed as fast as possible. No mining of tonnage is to be attempted until the east drift has been expanded 1,000 ft. to a connection with Hunter Creek Mining Co.'s ground, and westerly to the Lucky Friday's extension.

Diamond Drilling Activity

ARIZ

The Calari Mining Co. has reported to be conducting diamond drilling operations at its Ruth mine. It is understood that the tunnel will be extended north by 135 ft. and drift on the vein in both directions.

Diamond drilling has also started at the Sunset Mining Co.'s property near Superior.

New Machinery Installed at Desert Gold Mine

The Desert Gold Mining & Milling Corp. is installing new machinery at its property near Tucson. Ore is currently being stockpiled pending replacement of parts at the mill.

United Mining Corporation Constructing Road

CAL.

The Greater United Mining Corp, is constructing a road to its property in the New River area in northern Trinity County. Previous exploration work at the property has resulted in discovery of barite, gold, copper, and tungsten deposits. The new road will be used to develop these discoveries.

King Solomon Mine Resumes Operation

The King Solomon mine at Johannesburg, Keran County, has resumed active operation under direction of Max Hess and James Cristensen, who have leased the property from the Shipsey Mining Co. They plan to treat custom ore as well as operate the mine.

University of Washington Initiates Prospecting Course

WASH.

An exhaustive course in prospecting has been launched by the College of Mines of the University of Washington, Seattle, under direction of Professor Drury A. Pifer, formerly for eight years manager of a diamond mine in Kimberley, South Africa. Gold pans, sluice boxes and other prospecting aids will be used and students will have field trips to smelter, mines and metallurgical plants of the region, the course being designed to meet requirements of the GI Bill of Rights and reorient many ex-GI's to a life of prospecting and a career of mining.

Homer Coal Mines Producing

ALAS

Coal mines in the vicinity of Homer, Alaska, have been opened and good grade coal is being made available to local homes and businesses. Shipments to distant points are planned when transportation becomes available.

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Potash Mining

(*Continued from page* 28)

reel or battery, and these small units may be used also for gathering service in development headings. At Potash Company of America main line track is 42-gauge with 52-lb. rail in main headings and 30-lb. rail in rooms; at United States Potash Company 24-in. gauge track is installed, with 52-lb. and 30-lb. rail, respectively; and at International the gauge is 42 in. with 60 and 40-lb. rail in use.

Steel ties are used in advancing entries, but permanent and semi-permanent track is laid on untreated soft wood ties, ballasted and tamped with undercutter bug dust, or waste salt from the headings. Moisture from the air dampens the fill and renders it a splendid ballast as well as a good preservative for the ties.

At two mines, loaded mine cars are dumped at the shaft by a rotary dump; uncoupling of a train is not necessary because of swivel couplings on each car. At the third mine, Granby type cars and dump are in use. Under the dump at Potash Company of America and International is a hopper and a pan feeder which feeds a single roll tooth crusher. In passing through the crusher ore is reduced to five-in. maximum size and falls into a skip pocket from which it is loaded into five-ton capacity skips by automatic skip loaders.

Companies Constantly Striving to Improve Mining Machinery

At the Potash Company of America operation, the 7 AU Sullivan track-mounted Universal machine has passed the development stage and has been used when undercutting, overcutting, and side cutting is required. This machine has an 11-ft. cutter bar, but due to the fact that no water can be used, and therefore there is little dissipation of heat, the cutting speed must be kept below six in. per minute. If the 11-ft. cut is finally adopted, corresponding changes in drill rounds will be required. Three 10 RU Sullivan rubber-tired Universal cutting machines are also in use. Experiments have been conducted with home-made machines for the removal of bug dust. Experimental work is also being done with a track-type drill Jumbo capable of carrying two or four drills for use in development work.

At United States Potash Company the caterpillar bulldozer for use in grading, cleaning faces and ribs and for haulageway clean-up, has gone beyond the experimental stage and is an essential part of the equipment.

At International studies are being made of the application of belt haulage underground for main line hauls and for transverse systems in the panels. Because of the coarse breaking characteristics of the ore, it will probably be necessary to develop a portable elevator-grizzly-crusher unit, to be installed at the loading point on the belt, and designs for this unit have been submitted. Experiments in the use of rubber-tired undercutters and drill Jumbos are also being conducted.

One real problem that will face us in the next few years is the removal of pillars from underground. To this end a study of underground disposal of tailings will be necessary; also the means of transporting them from the surface and their packing in the workings. Already the technique of stacking mine waste using the Joy loader in reverse position has been worked out, and the next step is to find a way to pack refinery tailings over this waste to form a solid mass to the back. It is expected that the small amount of moisture in the tailings will cause the entire mass of fill to pack solid before adjacent pillars are removed.

Future of Gold

(*Continued from page* 40)

enough paper will be available to settle the excess of exports over imports. This situation, however, is not one that can persist indefinitely, and changes favorable to the gold miner should eventually result. With elimination of the present extravagances of government, with an approach toward a balanced budget, with restoration of multilateral trade, reduction of tariffs and removal of the multitude of wartime restrictions, and with sane financial policies among the major powers, inflation at home and even abroad may be beaten. Under such circumstances, the gold miner would benefit by stabilization of costs at a level that should allow him adequate profit.

In the world as it appears today, however, such a rational solution seems almost too much to expect. The present troubles arising from expanding paper currencies, tariff barriers, and nationalistic restrictions of one sort or another are likely to persist, at least to some degree, and devaluations of currencies in terms of gold are by no means unlikely. Under these circumstances, the gold miners must be alert to obtain their proper share of the apparent profits resulting from such transactions, not for their own selfish ends but for the preservation of their industry at a time when maintenance of a steady output of gold will be of critical importance. The manipulations by which profits from an increase in gold price might be turned entirely to national treasuries or to central banks are all too simple through arbitrary sales requirements, restrictions on ownership or on the right to export, or through charges for seigniorage or special taxes. Unfortunately some bad examples exists, and the industry should be aware of the sound counter-arguments and positive steps that it could take to resist them.

By far the best solution both for the country and the gold miners would be the avoidance of inflation through economies without tampering with the value of paper currencies in terms of gold. But even if this is not achieved, the value of gold is certain to remain as a stable and persistent standard against which shifting currencies are measured.

The gold miners in the long run will be best served by the solution that most effectively promotes multilateral international trade and stable world conditions under which spread between the price of gold and the cost of recovering it from its ores is likely to be maintained that will insure the steady annual increment from the mines that is necessary to enable gold to function smoothly in its traditional way.

MANUFACTURERS FORUM

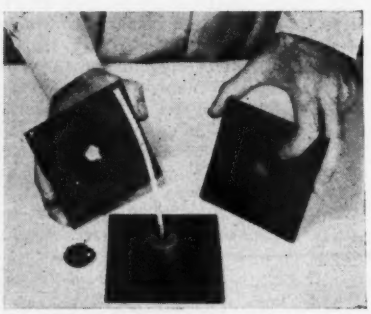
Exide Buys Chicago War Plant Property

The Electric Storage Battery Company has purchased a Chicago war plant from the War Assets Administration. The price paid was $1,000,000. The property, which is located at 5335 South Western Avenue Boulevard, consists of approximately seven acres of ground, with buildings containing 183,000 sq. ft. of floor space. It will be converted into a plant for manufacturing Exide Batteries.

The acquisition of these additional facilities is another step in Exide's expansion plans for locating manufacturing plants at strategic points as close as possible to the large markets for its products.

RDX to Have Industrial Use

The war's most powerful chemical explosive is the basic charge of the radically new Western "Big Inch" blasting fuse cap, it was announced by F. S. Elfred, Jr., general manager of the explosives divisions of Olin Industries, Inc., at East Alton. RDX, as this explosive was known, was the component of the super-blockbuster, Europe's most fearsome aerial bomb. It was also the explosive charge of the bazooka's projectile and of moulded demolition charges. Also known as cyclonite, RDX was once one of the most closey guarded secrets of the war, and because of its tremendous power it made possible the development of the smallest blasting cap heretofore manufactured.



Steel plate test is used to illustrate the initiating ability of blasting caps. The hole in the plate on the left was made with the new Western "Big Inch" cap arranged as shown on the center plate. The plate on the right has only a dome-shaped depression. This was made by using a conventional cap

Although powerful, the new "Big Inch" caps are claimed to be safer to handle than the ordinary type. They can withstand heavy shock and impact without detonating, and this feature is of particular importance to men who have to use them in mines, quarries, and on construction jobs. It is also claimed that this new detonator is unaffected by temperature extremes and stands storage better than conventional caps.

World's Biggest Shovel Dipper Takes 40-Cu.-Yd. Bite

The world's largest shovel dipper has just been completed by Marion Power Shovel Company of Marion, Ohio, and placed in operation on a Marion Type 5561 shovel of the Hanna Coal Company near Cadiz, Ohio.

This giant dipper is capable of moving enough earth at one bite to fill a room 12 ft. long, 10 ft. wide and 9 ft. high. On the 5561, this dipper can move the giant load two-thirds of a city block and drop it on top of a seven-story building.

Construction of the 40-yd. dipper and a newly-designed handle for it were made possible by the application of war-developed steels of new tensile strength and resistance to abrasion. These new steels cleared the way for a dipper and handle design which is 30,000 lbs. lighter than materials formerly used in achieving the same strength. Thus, it was possible to install the 40-yd. dipper on a machine which has been handling a 35-cu. yd. dipper in the past without adding to the front-end weight of the machine, even when the big dipper is fully loaded.

The big dipper is used to strip deep overburden from coal veins on Hanna properties in the vicinity of Cadiz. The big Marion machine is in operation 24 hours a day, seven days a week, and rapidly eats its way through high banks of overburden ranging up to 80 ft. Smaller machines follow the big Marion to load the veins of coal which have been laid bare by the stripping machine.

The Marion machine is powered entirely by electricity, and its power consumption is equal to that of a community of 3,000 persons.

"Air-Pak" Approved by Bureau of Mines

The Scott Air-Pak, a new type of self-contained breathing apparatus, designed and manufactured by the Scott Aviation Corp. of Lancaster, N. Y., has just been granted Approval No. 1308 by the Bureau of Mines.

This equipment has been acclaimed as the greatest advancement in "safe-and-easy-to-use" self-contained breathing apparatus in 20 years.

It has been widely accepted by municipal fire departments for both rescue equipment and for firemen or other persons to safely enter a smoke-filled area or an area with air contaminated by ammonia or other obnoxious or deadly fumes.

The placing of the stamp of approval on this equipment by the Bureau of Mines will now allow its use in mines and will also greatly widen its use in the industrial, municipal and marine fields.

Further information may be had by writing to Safety Equipment Division, Scott Aviation Corp., Lancaster, N. Y.

New Wire Rope Manual

An interesting reference manual and catalogue on the uses and selection of wire ropes for mining has just been published by Rochester Ropes, Culpeper, Va. It has been written to give condensed coverage of the entire subject of mining ropes, yet it is compact in size, only 4¼ x 7¼ inches, made to take little space on a reference shelf or to be carried in a pocket. It is attractively designed and is printed in two colors.

About one-third of the manual is devoted to fundamental engineering data on wire ropes and general principles governing their use and selection. In a section in which various mining ropes applications are discussed authoritatively, recommendations are given for ropes used for shafts, slope cars, car pullers, mining machinery, conveyors, dredges and strip and open-cut equipment.

At the end of the manual is a group of well-arranged rope selection tables, prepared to simplify the choosing of correct ropes for various purposes. The entire booklet is indexed for rapid reference. Copies may be obtained by writing the company direct.

New All Steel Squirrel Cage Induction Motor by Westinghouse

All steel construction—frame, feet and end brackets—makes possible a squirrel cage induction motor that is 35 per cent smaller in size than its predecessor without sacrifice of electrical properties. In addition, it is lighter, more rigid and can withstand greater impact.

Known as the "Life-Line" motor, it is available in drip-proof, splash-proof and fan cooled construction. Its special features are: a frame rolled from steel plate that is as thick as it would be if made from cast iron; feet and end brackets of heavy pressed steel; all welded construction; self-sealed, pre-lubricated ball bearings that provide effective lubrication for five years or longer without repacking; rounded corners at top and bottom of slot cells that eliminate creasing cell insulation; special synthetic resin covered wire for coils; dynetrically balanced rotor; and interchangeability of parts as there are only 13 parts and sub-assemblies.

It is available in sizes from ½ to 20 hp.; in voltages of 208, 220, 440 and 550; in two and three phase; in frequencies and speeds of 60 cycle—3,500, 1,750, 1,150 and 865 r.p.m., of 50 cycle—2,920, 1,450, 965 and 720 r.p.m., and 25 cycle—1,450 and 725 r.p.m.; and in NEMA Standard dimension frames 203 to 326.

Announcements

George P. Torrence, executive vice president of **Link-Belt Company** since July 1, 1946, became president of the company, effective November 1, succeeding William C. Carter. In his 25 years with Link-Belt, Mr. Torrence served in various capacities, beginning as draftsman. He was manager of the Indianapolis operations from 1926 to 1932 and president from 1932 to 1936.

Mr. Carter, who had been president since December, 1942, has retired from this position in accordance with the company's retirement plan. He continues as a director of the company and as chairman of the executive committee of the Board. The other members of the committee are Howard Coonley and Russell Livermore. Mr. Carter will continue to serve the company as a consultant, which will give the organization the benefit of his long experience, especially needed during this period.

* * *

Kennametal, Inc., Latrobe, Pa., announces appointment of Max J. Caylor as mining district representative for Kennametal's Pennsylvania District, which comprises the states of Pennsylvania and Ohio with headquarters at the Latrobe office.

* * *

Beckley Machine & Electric Co. announces the continuation of business under new ownership, and the following newly-elected officers: Gordon MacVean, president and general manager; R. H. Magee, vice president and assistant general manager; and E. J. Nicholls, secretary and assistant treasurer.

G. V. Leece, vice president of **Gardner-Denver Co.**, has been appointed general sales manager for the company, effective immediately. Mr. Leece joined the Gardner-Denver Co. in 1922 and is now rounding out approximately 24 years of service. For the past two years his position has been that of vice president in charge of the Export Division with offices in New York City. He will now be located in the company's plant at Quincy, Ill.

* * *

Russell P. Proffitt, since 1933 Chicago divisional manager of the **Timken Roller Bearing Co.**, has been transferred to the Washington, D. C., office as district manager, according to a recent announcement by officials of the Canton, Ohio, firm.

Proffitt, a mechanical engineer, began his career with Timken in 1923 in the Huntington, W. Va., office, where he introduced and developed the use of Timken bearings in mining equipment, as an improvement over the plain or cast iron bearings that were then genrally in use.

* * *

Announcement of the appointment of Helmer Peterson as factory manager of **Mack-International Motor Truck Corporation's** Long Island City, N. Y., plant, has been made by A. N. Morton, vice president. In his new capacity Mr. Peterson will oversee the manufacture of Mack fire apparatus, as well as the fabrication of replacement parts for obsolete models of the entire Mack line. Employed by Mack since 1942, his headquarters have heretofore been located at that company's Plainfield, N. J., plant.

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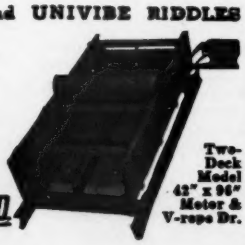

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PRE-PRESSURE GROUTING FOR MINE SHAFTS... GROUND SOLIDIFICATION FOR WET MINE AREAS BY OUR STOP GROUT METHOD. WATER WELLS AND DISCHARGE HOLES DRILLED AND GROUTED... ELECTRIC DRILLS FOR INSIDE MINE DRILLING..

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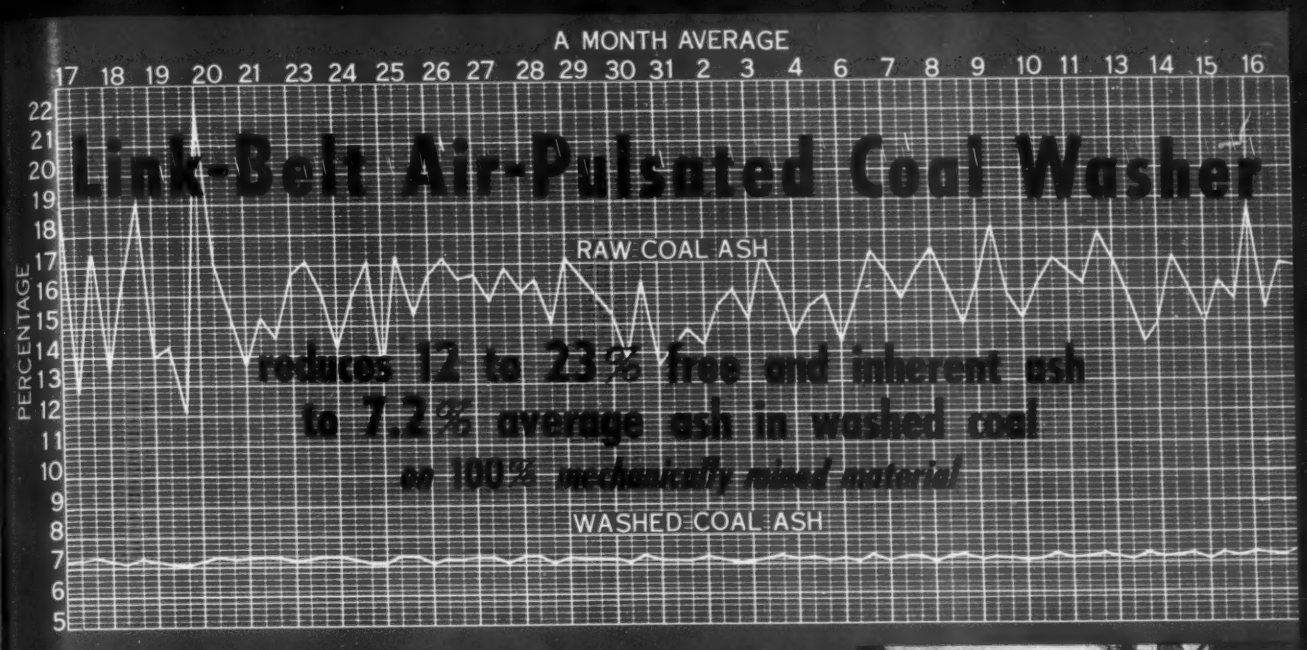
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PERCENTAGE
22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5
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reduces 12 to 23% free and inherent ash
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on 100% mechanically mined material
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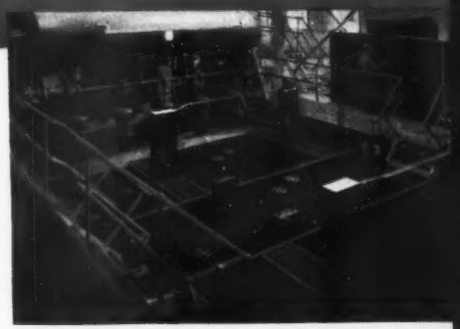
● The Link-Belt air-pulsated coal washer is an economical and practical solution to coal washing problems. From mechanically extracted coal containing large and variable amounts of impurities, a clean coal of remarkably uniform quality is being produced by this system. Scores of installations in service in many coal producing areas testify to its high efficiency. A good example of this is illustrated by the graph above, showing how the Link-Belt air-pulsated washer takes a highly variable mine output and converts it into a coal of uniform ash content. It is an actual case record of a 28-day consecutive operation on coal from the Pittsburgh seam. The upper curve shows the variation in the raw coal feed to the washer, which ranges from 12% to 23% ash. The lower line shows the ash content after going through the Link-Belt washer—averaging 7.2% ash, between 7% and 7.4%. The coal is 100% mechanically mined.

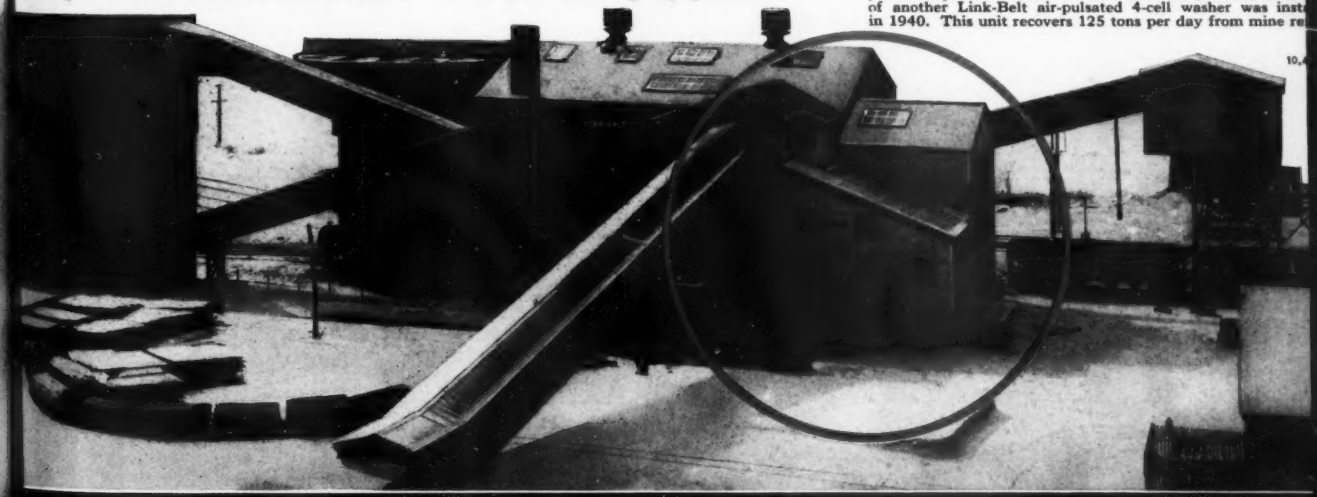
We'll be glad to give you additional information on Link-Belt air-pulsated washers and other preparation and handling equipment.



LINK-BELT COMPANY

Chicago 9, Philadelphia 40, Pittsburgh 19, Wilkes-B
Huntington, W. Va., Denver 2, Kansas City 6, Mo.,
Cleveland 13, Indianapolis 6, Detroit 4,
St. Louis 1, Seattle 4, Toronto 8.

Original Link-Belt washery, blending, drying and crus
plant completed in 1938. A new addition (circled) consi
of another Link-Belt air-pulsated 4-cell washer was inst
in 1940. This unit recovers 125 tons per day from mine re



10,4

COAL PREPARATION AND HANDLING EQUIPMENT

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Mainstays of Mine Safety

on every job underground

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By doing their own jobs well, Edison Electric Cap Lamps and M.S.A. Comfo Caps help the success of every miner's work. The safety factors of more effective light and better head protection guard *men and production* . . . and lower costs. *Ask for a practical demonstration!*

Illustrations above courtesy of United States Steel Corporation

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